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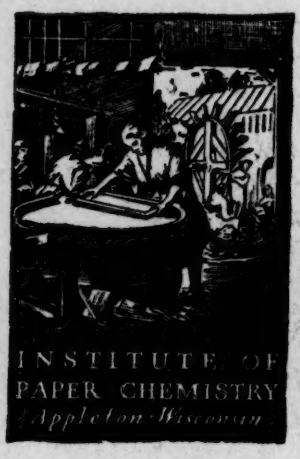
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

SEPTEMBER · 1951

Volume 22 Number 1

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Periodicals, Books, and Pamphlets Added to the Library During August

PERIODICALS—BACK VOLUMES

Proceedings of the Iowa Academy of Science, v. 57, 1950.

BOOKS AND PAMPHLETS

CHEMICAL LITERATURE

AMERICAN CHEMICAL SOCIETY. *Division of Chemical Literature.* Searching the chemical literature. A collection of the papers presented at the Symposium on Searching the Chemical Literature . . . at the 117th meeting in Detroit, April 16-21, 1950 . . . No. 4 of the Advances in chemistry series, ed. by the staff of *Industrial and Engineering Chemistry.* Washington, The Society [c1951] 184 p.

CHEMISTRY—YEARBOOKS

CHEMICAL SOCIETY, *London.* Annual reports on the progress of chemistry for 1950. London, The Society, 1951. v. 47. 490 p.

DISSERTATIONS, ACADEMIC—ZURICH

ZECHMEISTER, LÁSZLÓ. Zur Kenntnis der Cellulose und des Lignins. Von der Eidgenössischen Technischen Hochschule in Zürich zur Erlangung der Würde eines Doktors der technischen Wissenschaften genehmigte Promotionsarbeit. Zürich, The Author, 1913. 75 p.

ECONOMICS

MONTGOMERY, GEORGE S., JR. The return of Adam Smith. Caldwell, Idaho, The Caxton Printers, Ltd., 1949. 147 p.

ENGINEERING INSTRUMENTS

BEHAR, M. F., ed. The handbook of measurement and control. Pittsburgh, The Instruments Publishing Company, Inc., c1951. 291 p.

FUNGI

LILLY, VIRGIL GREENE, and BARNETT, HORACE L. Physiology of the fungi. New York, McGraw-Hill Book Co., 1951. 464 p.

NEWSPRINT

U. S. CONGRESS. HOUSE. *Committee on the Judiciary. Subcommittee on Study of Monopoly Power.* Newsprint. Part 1. Report of the Subcommittee . . . pursuant to H. Res. 95 (82d Cong., 1st

Sess.), submitted by Mr. [Emanuel] Celler. Washington, U. S. Govt. Print. Off., 1951. 132 p.

PAPER—DYEING

CORNELY, BERTHOLD. Das Färben von Papier; ein Handbuch für den Papierfärber. Berlin, etc., Springer-Verlag, 1951. 243 p. 16 tables.

PAPER—PERMANENCE

U. S. NATIONAL BUREAU OF STANDARDS. Preservation of the Declaration of Independence and the Constitution of the United States; a report by the National Bureau of Standards to the Library of Congress. Natl. Bureau of Standards circular 505. Washington, U. S. Govt. Print. Off., 1951. 16 p.

PAPER MAKING AND TRADE

THE PULP and paper manual of Canada; a publication that keeps pace with current developments in equipment, describes ideas for maintaining of plant machinery and provides a catalogue of the equipment and supplies available to the pulp and paper industry with an extensive classified index of equipment and supplies. 19th ed. Gardenvale, Que., National Business Publications Ltd., 1951. 461 p.

PAPER MAKING AND TRADE—DICTIONARIES

AMERICAN PAPER AND PULP ASSOCIATION. The dictionary of paper, including pulps, boards, paper properties and related papermaking terms. 2d ed. [Clarence J. West, editor] New York, The Association, 1951. 393 p.

PAPER-MAKING MACHINERY

D'AMBRY, ROBERT W. Leadership by design. The story of the phenomenal growth of the container industry and how the Samuel M. Langston Company, through a half century of superiority in equipment design, attained leadership in the manufacture of paperworking machinery, 1901-1951. Camden, N.J., Samuel M. Langston Company [c1951] 93 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ASSOCIATIONS

ANON. Report of the general meeting, 1951, of the association "Zellcheming" in Detmold. Das Papier 5, no. 13/14: 281-94 (July, 1951); Wochbl. Papierfabr. 79, no. 11: 351-2 (June 15, 1951). [In German]

A report of the 1951 general meeting of the Verein der Zellstoff- und Papier-Chemiker und -Ingenieure (Zellcheming) with abstracts of the papers and brief discussions is presented. E.S.

DELCROIX [PIERRE] Discussions on co-operation. Bull. assoc. tech. ind. papetière 5, no. 4: 176-200 (June, 1951). [In French] *cf.* B.I.P.C. 21: 694.

This is a general discussion on the possibilities of interassociation co-operation in France and other countries on certain problems of documentation which are more or less common to all. The author gives his ideas on the possibilities of a translation pool and a uniform classification system; many others participated in the discussions. E.S.

PULP & PAPER. Associations of the industry. Pulp & Paper 25, no. 7: 70-1 (June 30, 1951).

The associations of the United States, Canada, and Mexico are listed, including photographs of presidents and chairmen, office addresses, and names of top office or managerial executives. E.S.

BACTERIOLOGY

DICKERMAN, J. M., and STARR, T. J. A medium for the isolation of pure cultures of cellulolytic bacteria. J. Bact. 62, no. 1: 133-4 (July, 1951).

The heavy membrane or mat formed by *Acetobacter xylinodes* was used as a medium for the isolation of pure cultures of cellulolytic bacteria. The preparation of the membranes is described. Two identical series of media were prepared, and 2.5% of *Acetobacter* membrane material was added to one and 0.2% of cellobiose to the other. The crude cultures were plated out in each series of media, and the results obtained with both series were identical. Pure cultures of 12 strains of aerobic, two strains of anaerobic-mesophilic, and three strains of anaerobic-thermophilic cellulolytic bacteria were isolated. M.W.

BAMBOO

THORIA, L. The suitability of bamboo pulp for the manufacture of viscose rayon. Melliand Textilber. 32, no. 4: 282-3 (April, 1951). [In German; English, French, and Spanish summaries] *cf.* B.I.P.C. 21: 763-4.

Data are given which show that bamboo pulp cooked by Raitt's fractional process of digestion, following an acid prehydrolysis (1% sulfuric acid at

100°C. for four hours) equals imported Scandinavian dissolving pulp, except for a higher ash and iron content and a lower viscosity of the viscose, which also includes a higher percentage of insoluble matter. By minor adjustments in the process it is expected that these difficulties will be overcome; the suitability of bamboo pulp for the manufacture of rayon has been established. 2 tables. E.S.

BARKERS AND BARKING

ANON. Bark-peeling machine and methods. Lake States Timber Digest 5, no. 10: 8-10 (August, 1951).

Different types of mechanical bark peelers, performance factors, and operational data are described, and some of the causes of variations in production, e.g., lack of continuity of input, irregularity of pieces, and frozen wood, are discussed. M.W.

BEATING

GLOVER, G. F., RAY, P. F., and PRITCHARD, E. J. Symposium on beating. II. An investigation of the beating process with the aid of the Valley laboratory beater. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 2: 335-59; discussion: 371-413 (May, 1951); World's Paper Trade Rev. 135, no. 25: 1821-8, 1833-8 (June 21, 1951); *cf.* B.I.P.C. 21: 782.

A series of experiments on several pulps [a mildly bleached sulfite (A), a high-alpha bleached sulfite (B), a bleached sulfate (C), and a short-fibered hardwood (D)] is described. The tests were carried out with a Valley laboratory beater for the purpose of studying the changes in sheet properties during beating. During the course of the work, it was felt that information regarding the gap between the bedplate and roll would be of great interest, and eventually an apparatus was devised for the continuous recording of the distance between the roll and the bedplate. The beater, the gap-measuring apparatus, and the individual experiments are described in detail. The measurements of gap width taken in conjunction with measurements of the fiber length of the stuff and normal and special physical tests on sheets made at each stage (S.-R. wetness, breaking load and stretch, tear, and density) were found to be of considerable interest and significance in the study of the beating process. Beating involves the cutting of the fibers into shorter lengths and some kind of action on their surfaces so that they will bond together when the sheet is dried. The higher beating pressures reduce the average fiber length at a rapid rate, whereas lower pressures do not cut the fibers very much but cause fibrillation or hydration. An excessive reduction in fiber length is detrimental to sheet strength, the tear in particular. Two series of the present experiments—where the leading edge of the bedplate was operated flush with the first bar in one case and with the edge protruding 2 mm. in the other, show that the ratio of cutting to the preparation of the fiber surface can be altered in the Valley beater by a rather small change in configuration. None of the simply measured characteristics of a pulp served to define "beating degree." S.-R. wetness, although useful in many ways, can be very misleading. Density is a useful guide, but does not give the entire picture. Although fiber length can be measured, the state of the fiber surfaces or their degree of fibrillation cannot be determined without making sheets and testing them. The curves obtained for load *versus* extension show interesting changes during beating. The plastic or irreversible extension tends to be greater when the pulp has been beaten with lower pressure; it is quite small at the higher beating levels of pulp A. It is possible that fiber length plays some part in these changes, but it should be noted that at equal fiber lengths, pulp B shows considerably more plastic or irreversible exten-

sion than pulp A, and pulp C shows more plastic flow than pulp B. The shapes of the family of curves obtained for each pulp were found to be intimately connected with the properties of the individual fibers and the way they have been treated. The measurement of the roll-bedplate gap shows that pulps differ in their capacity to withstand roll pressure and that the rate of change with beating time is characteristic of the pulp. Physical properties of the fibers (such as rigidity, resistance to cutting, and the presence or absence of weak spots) appear to determine the initial gap width and the rate of reduction of fiber length. It appears that cutting action can take place at a rapid rate when the gap is wide. otherwise it would not be possible for the fiber length to shorten rapidly in the early stages. The maximum sheet strength for pulps A, B, and C was obtained when the gap was never below 0.004 in. In those cases where the gap had decreased to 0.001 in., the cutting action seems to have been too great for the best strength development. 6 tables, 27 figures, and 5 references. E.S.

BLEACHING

ARRIAS, E. Bleaching with sodium chlorite. Papierwereld 5, no. 5: 200-4 (December, 1950); Tech. Bull. Tech. Sect., Paper and Board Makers' Assoc. 28, nos. 1-3: 5 (January-March, 1951). [In Dutch; abstract in English]

Investigations at the Vezelinstitut T.N.O. with sodium chlorite bleaching of linen are reported, with particular emphasis on the highest attainable whiteness and least degradation of cellulose with a minimum of chlorite consumption. The best results were obtained with 10 g. of chlorite per liter, at a pH of 5.5, at 70°C., and with a bleaching period of five hours. Brightness values of 60-62 measured with the V.I. spectrophotometer were obtained. At temperatures above 70° or with other pH values, the cellulose was attacked and chlorite consumption rose steeply; under these conditions and with bleaching periods in excess of five hours no improved brightness results were obtained. A brightness of 72 was reached by chlorite bleaching in two stages with an intermediate alkaline cook (10 g./liter) for one hour; the total chlorite consumption was 10 g./100 g. of unbleached linen. The cellulose showed little degradation. Further work on the application of chlorite to the bleaching of paper pulps is under way. 1 table and 3 diagrams in the original. E.S.

BOARD TESTING—PHYSICAL

KOTTE [HANS] and PARIS, PAUL. Strength of folding boxboard; the decrease in breaking load through preceding conversion techniques. Allg. Papier-Rundschau no. 6: 210-12 (March 26, 1951). [In German]

The first of the two authors describes the problem of the recipient of a consignment of folding-box blanks which frequently tore along the creased lines when the boxes were set up. Experiments with sample strips of different types of board creased by different techniques in the machine and cross-machine direction were made; all showed a decrease in tensile strength after creasing; the results, however, did not show any uniform trends and did not permit any definite conclusions to be drawn with regard to the most responsible factors. The study was submitted to the second of the two authors whose comments are appended. In his opinion, the strength testing of folding boxboard should not be carried out on the flat material but after it has been set up and bent around an angle of 90°. Reference is made to a preliminary prewar study with different boards before and after crease breaking around 180°; the data show a definite decrease in tensile strength after one crease breaking in each case, and a further decrease when the procedure was repeated. The machine direction of the board seems to exert

an influence on tensile strength after bending but varies with creasing procedure and type of board, so that optimum conditions for each individual case would have to be established. Extensive fundamental studies are still lacking and would be urgently needed to clarify conditions. 5 tables, 3 figures, and 1 reference. E.S.

CALCULATIONS

BERNINGHAUS, H. The optimum efficiency number in the operation of a cutting and creasing platen press. Allg. Papier-Rundschau no. 2: 47-9 (Jan. 26, 1951). [In German] *cf.* abstract below.

A criticism of some of the statements by Gut and a corrected formula are presented. 1 nomogram. E.S.

GUT, H. The optimum efficiency number in the operation of a cutting and creasing platen press. Allg. Papier-Rundschau no. 19: 949 (Oct. 12, 1950). [In German]

Calculations are presented for determining the cost of operation and the optimum "efficiency number" of the platen of a cutting and creasing press, i.e., the layout which will permit the largest number of blanks with the least amount of waste to be prepared at the lowest manpower, tool, and make-ready cost. E.S.

CAUSTIC SODA

SPRINGER, R. A. How to handle liquid caustic. Chem. Eng. 58, no. 8: 112-13, 282 (August, 1951); Tappi 34, no. 9: 125-8A; discussion: 128-9A (September, 1951).

The types of piping, pumps, materials of construction, and storage facilities which should be used in handling 50 and 73% liquid caustic soda are discussed. The dilution problems of both strengths and their respective advantages for industrial use are considered. 3 tables and 1 figure. M.W.

CELLULOSE

SIPPEL, A. The problem of cellulose modifications. II. The refinement of the trough-shaped model of cellulose. Kolloid-Z. 122, no. 1: 20-3 (April, 1951). [In German] *cf.* B.I.P.C. 21: 685-6.

A second modification of a periodic, tension-free model for cellulose is proposed in which the unit length of cellobiose amounts to 10.3 A. 13 figures and 8 footnotes. E.S.

CELLULOSE—DEGRADATION

MITCHELL, R. L. Degradation rate of cellulosic pulps. Ind. Eng. Chem. 43, no. 8: 1786-9 (August, 1951).

At least two factors control the viscosity of a viscose solution. One is the D.P. of the pulp, the other the rate at which the cellulose degrades under conditions of alkaline oxidative degradation. A procedure has been devised for measuring this value, based on the measurement of degradation increase when alkali cellulose is aged two hours at 50°C. in oxygen. The degradation rate has been found to depend upon the strength of the caustic used in the steeping procedure. One modification of the method makes it possible to compare pulps as to relative degree of mercerization by using 2% caustic instead of the 18% used in the above procedure. Data are given to show how the degradation-rate measurements supplement initial D.P. values. One interesting application of the 2% caustic aging treatment is the provision of a sensitive test to determine whether pulps have previously been exposed to strong caustic soda solutions. 4 tables, 5 figures, and 9 references. H.F.L.

CELLULOSE—SOLUBILITY

KÖNIG, WALTER. The solubility of cellulose in sulfuric acid with reference to the manufacture of films and threads from cellulose-sulfuric acid solutions. Melliand Textilber. 32, no. 4: 290-5 (April, 1951). [In German; English, French, and Spanish summaries]

Following a review of earlier efforts for preparing spinnable cellulose solutions with sulfuric acid, the author shows that it is practically possible to prepare such solutions from which commercial films and threads can be manufactured. The principle of his procedure was already recognized by R. Langhans in his German patent 72,572, granted in 1893, and involves the stepwise treatment of cellulose in solutions of different concentrations. The material is first treated at a concentration which loosens the fiber union without dissolving the cellulose, followed by a treatment at a higher concentration at which complete solution takes place. The optimum concentrations vary for different pulps and temperatures. For instance, beechwood pulp completely dissolves at 5°C. in 61.5% sulfuric acid, at 15° in a concentration of 62.5%; the corresponding values for cotton linters are 63 and 64.5%, respectively. For practical application, lower than optimum concentrations for the loosening stage are recommended (50% at 15°). The method is comparatively simple and requires only sulfuric acid, in addition to the pulp. The identical machinery as used in the viscose process can be employed. The economy depends upon the successful recovery of the sulfuric acid. The author prepared films according to this procedure which showed the same mechanical properties as viscose films; difficulties in the slow coagulation of threads can be solved by the agitation of the spinning bath and rapid removal of the acid from the formed threads. Spinning rates of 80 m./min. (as compared with 2-3 m./min. when spun into a quiescent bath) became possible. 5 tables, 6 figures, and 17 references. E.S.

CHEMICAL TESTING—CHLORINE

GIERTZ, HANS WILHELM. Bleaching with chlorine dioxide. I. Analytical methods. Svensk Papperstidn. 54, no. 14: 469-76 (July 31, 1951). [In Swedish; English and German summaries]

Several compounds containing chlorine in different states of oxidation are formed during the bleaching of pulp with chlorine dioxide and chlorites; colorimetric methods are described for the quantitative determination of these compounds, either individually or in mixtures. (1) Active chlorine compounds, such as chlorine, hypochlorite, chlorite, and chlorine dioxide, are determined in acid solution in the usual manner. (2) Chlorate is determined in a strongly acid solution containing potassium bromide in an atmosphere of carbon dioxide. (3) Mixtures of chlorine dioxide and chlorite are analyzed by the following method, the principle of which was proposed by Bray (*cf.* Z. phys. Chem. 54: 569-608 [1906]). The sample is pipetted into a solution of potassium iodide buffered to a pH of 7-7.5 by means of diphosphate. Under these conditions the chlorine dioxide is reduced to chlorite which does not react any further. If the sample is titrated immediately, the thiosulfate consumption is equivalent to one fifth of the amount of chlorine dioxide present. The solution is then acidified so that the chlorous acid reacts with the potassium bromide, and is titrated again after three minutes. The consumption of thiosulfate in this titration is equivalent to four fifths of the chlorine dioxide and all the chlorite of the original sample. (4) The analysis of aqueous solutions containing chlorine dioxide and chlorine can be carried out according to (3). In this case the chlorine reacts in the first stage of the determination; however, on account of iodate formation, this analysis is not quite precise. Chlorine dioxide solutions follow Beer's law and are

suitable for colorimetric measurements in the wavelength range of 400-450 mμ. Mixtures of chlorine dioxide and chlorine may be analyzed by determining the chlorine dioxide colorimetrically and the total oxidizing capacity iodometrically. To prevent the loss of gaseous components the samples and reagents should be covered with a film of paraffin oil. Inert, low-viscosity oils are used for the same purpose during the pipetting operations and colorimetric determinations. 8 tables, 4 figures, and 11 references. E.S.

CHEMICAL TESTING—CRUDE FIBER

TODD, J. R. Effect of altitude on the estimation of 'crude fibre.' Nature 168, no. 4263: 76-7 (July 14, 1951).

Estimation of crude fiber by the Weende method was carried out on samples of material of varying fiber contents at a high altitude and compared with the results of similar estimations made at sea level. The reduced boiling temperatures at high altitudes result in a higher estimation of crude fiber content than that obtained at sea level. It was found that the extent of error varied with the type of material, and the greatest variation occurred in materials with low fiber content. It is pointed out that the estimation of lignin at high altitudes probably would be similarly affected. 1 table. M.W.

CHEMICAL TESTING—MOISTURE

JOHANSSON, AXEL. The micro-determination of water. Indian Pulp and Paper 5, no. 11: 452-5 (May, 1951).

A method for the microdetermination of water with a modified Karl Fischer reagent is described in detail. The sample is dissolved or suspended in a solution of sulfur dioxide in pyridine-methanol and titrated with a methanol solution of iodine. To minimize the influence of moisture in the air, the method is further modified so that the hydrogen iodide formed by the reduction of the iodine is converted to iodic acid by means of bromine. The iodic acid is then determined by adding potassium iodide and titrating the liberated iodine with thiosulfate. For every mole of water, 12 equivalents of iodine are formed, i.e., 1.5 mg. of water correspond to 10 ml. of 0.1 *N* thiosulfate. This procedure has the advantage that moisture in the air has to be excluded only during the addition of the iodine. 1 table and 9 references. M.W.

CHEMICAL TESTING—PULP—ALPHA CELLULOSE

JENTGEN, H. The determination of α-cellulose. Reyon, Synthetica, Zellwolle 29, no. 6: 219-22 (June, 1951). [In German]

The original procedure for the determination of α-cellulose was developed by the author in 1911 for evaluating the possible quantity of rayon obtainable from 100 kg. of chemical pulp at a time when the pulp mills did not produce special dissolving pulps, but delivered to the rayon mills a well-bleached sulfite pulp of a grade suitable for paper manufacture. The author discusses the inherent shortcomings of the method and different later modifications and criticizes its application to the evaluation of pulp quality. With the advanced knowledge in the field of cellulose chemistry, it has become known that the suitability of a dissolving pulp depends upon many additional factors (such as viscosity, filtering properties, D.P., swellability, absorptivity, shrinkage, etc.) and that the textile characteristics of the finished rayon are principally influenced by the spinning procedure. The α-cellulose determination has already lost much of its significance; it should certainly not be applied for purposes for which it was never intended and for which it is not suitable. 5 references. E.S.

CHEMICAL TESTING—PULP—COOKING DEGREE

ÅLANDER, P. The relationship between different cooking-degree numbers and some factors influencing this relationship. Paper and Timber (Finland) 33, no. 6: 201-9; no. 7: 229-31 (June, July, 1951). [In Swedish; English summary]

Conversion tables and diagrams (based on a large amount of testing material) have been prepared for the different values used in defining the cooking degree of a pulp (Roe, Tingle, Bergman, Enso, Sieber, Björkman, TAPPI, Östrand-Söderquist, and Halse). The lack of agreement with the German and Swedish conversion tables and possible reasons for the discrepancies are discussed. The different preparation of the samples and variations caused by cooking procedures and the raw material are given as some sources of error. A certain lack of accuracy must therefore be accepted and taken into consideration when converted cooking-degree numbers are applied. The influence of several factors on different cooking-degree numbers has been investigated. It was found that the Roe number is influenced by the pitch in the sulfite pulp as well as by the ash content (lime sludge) of the sulfate pulp. The magnitude of the influence of these factors has been determined. Within the fairly narrow limits of pitch and ash-content variations in commercial pulps, the errors caused by the conversion are, however, comparatively small. 9 tables, 10 diagrams, and 23 references. E.S.

CHEMICAL TESTING—PULP—CUPRAMMONIUM VISCOSITY

MARTIN, A. F. Toward a referee viscosity method for cellulose. Tappi 34, no. 8: 363-6 (August, 1951).

A referee method for cellulose viscosity should combine the following features: reproducibility, rapidity, simplicity, correlation with use properties, correlation with chain length, and applicability to all types of cellulose. The method should also protect the cellulose from degradation during measurement and should encompass the best features of modern techniques of viscometry, including correction for velocity gradient. No existing viscosity method appears to provide a suitable combination of all the features mentioned above. A new possibility for fulfilling the above requirements more completely has been suggested by a statistical study of the errors inherent in using the author's equation (*cf.* Ott, E. Cellulose and cellulose derivatives. New York, Interscience Publishers, 1943, p. 951) relating observed to intrinsic viscosities. It is proposed that intrinsic viscosity be used as the reported viscosity value for all samples. Viscosities would be run at a concentration such that for all samples the product of intrinsic viscosity and concentration would always be the same value. Under these conditions, all viscosities would be measured at a standard velocity gradient. Although the expressions given in this paper have been derived on the basis of the Martin equation, the same principles could be applied if other viscosity-concentration relationships were used. 6 figures. E.S.

CHEMICAL TESTING—PULP—IRON

KINGSBURY, R. M. Determination of iron in wood and wood pulp. Tappi 34, no. 8: 382-4 (August, 1951).

A rapid and precise method for the determination of iron in wood and pulps is described. The procedure consists of the wet digestion of the material, the reduction of iron to the ferrous form, and the spectrophotometric determination of iron in the form of the *o*-phenanthroline complex. The sensitivity and reproducibility of the method are in the range of 1 p.p.m. 2 tables, 1 figure, and 10 references. E.S.

CHLORINATION PROCESS

GRAND, L. A process for the manufacture of pulp. Bull. assoc. tech. ind. papetière 5, no. 4: 201-6 (June, 1951). [In French]

Chlorine in aqueous solution (I) gives rise to hydrochloric acid and hypochlorous acid (II) and, on attempted delignification of Asplund pulps, the hydrochloric acid invariably causes widespread degradation and yields low-quality pulps. On the other hand, the judicious addition of calcium carbonate to (I) gives rise to what is essentially an aqueous solution of (II) and calcium chloride. By continuing to pass chlorine into such a solution, the aqueous mixture (III) contains both (II) and molecular chlorine. (III) was used successfully in delignifying defibrated straw, poplar, and pine and gave pulps of high quality, the physical properties of which are listed in tabular form. By giving the defibrated raw materials a mild alkaline pretreatment at atmospheric pressure and 80-100°C., followed successively by cold treatments with (III), washing with water, then with aqueous alkali to remove the chlorolignins, and a mild peroxide bleach, excellent bright paper pulps could be obtained. The successive oxidizing treatments, however, may have to be repeated two to three times, depending on the desired results. Patent applications for the process have been made. 4 tables.

L.E.W.

CHROMATOGRAPHY

ROCKLAND, LOUIS B., BLATT, JEREMIAH L., and DUNN, MAX S. Small scale filter paper chromatography; filter papers and solvents. Anal. Chem. 23, no. 8: 1142-6 (August, 1951).

Investigations were undertaken because of the rapidly growing interest in and importance of filter paper chromatography as a tool for the qualitative identification and quantitative determination of amino acids and other biological substances. Thirteen filter papers have been rated on the basis of seven physical and chemical characteristics, the influence of the paper on the R_f values of 18 amino acids has been studied, the influence of the water content of eight water-miscible solvents on R_f values of amino acids has been investigated, and the R_f values (ratio of the length of the chromatogram to the distance traveled by the solvent boundary) of amino acids representative of the acidic, basic, neutral, and cyclic groups have been determined. The fixed and most common sequences of the amino acids, the solvents yielding inverted sequences, and the solvents most effective in separating individual amino acids, pairs of amino acids, and groups of amino acids have been determined. 4 tables, 6 figures, and 19 references. E.S.

CHROMIUM PLATING

SOGECRO. Hard chromium plating in the pulp and paper industry. Papeterie 73, no. 7: 379, 381 (July, 1951). [In French]

The advantages of chromium plating applied to various parts of paper machines, refiners, cylinder bearings, and similar equipment are discussed briefly. L.E.W.

CLAY

KINGERY, WILLIAM DAVID. Fundamental study of clay. XI. Note on the effect of fluoride ions on a clay suspension. J. Am. Ceram. Soc. 34, no. 8: 242-4 (August, 1951); *cf.* B.I.P.C. 11: 398.

The effect of fluoride ions on the viscosity, yield point, pH, and conductivity of hydrogen-clay slips and a calcium-clay slip is shown. These data indicate that fluoride ions deflocculate hydrogen-clay slips by the same

mechanism as hydroxyl ions because these ions are isoelectric and approximately the same size. The data tend to confirm the electrocratic theory of deflocculation. The fluoride ion was not effective for deflocculating the calcium-clay slip. 1 table, 5 figures, and 3 references. E.S.

CLEANING COMPOSITIONS

THIBADEAU, A. T. Steam-detergents speed cleaning. Paper Mill News 74, no. 33: 53, 87 (Aug. 18, 1951).

Some examples are given of the uses to which Oakite steam-detergent cleaning methods and materials can be applied by paper manufacturers. M.W.

COLOR

HURVICH, LEO M., and JAMESON, DOROTHEA. A psychophysical study of white. I. Neutral adaptation. J. Optical Soc. Am. 41, no. 8: 521-7 (August, 1951).

A discussion is presented of the concept white as it is used to describe properties of light, properties of objects, and properties of sensation. The concept can have both practical and theoretical significance only when the psychophysical functions relating the sensation white to the stimulus variables are known. An apparatus and method used to obtain such functions are described. Data are presented for three observers, for a neutral state of adaptation, dark surround, 11.7° test field, and a one-second stimulus duration. White threshold contours are shown which relate the approximate color temperature of the test stimulus and the luminance required to evoke a sensation of absolute white. These contours form the lower boundary of a white sensation area, in which all color temperature-luminance combinations evoke an absolute white sensation of the given observers and experimental conditions. 3 figures and 25 footnotes. E.S.

JAMESON, DOROTHEA, and HURVICH, LEO M. A psychophysical study of white. II. Neutral adaptation. Area and duration as variants. J. Optical Soc. Am. 41, no. 8: 528-36 (August, 1951).

Experimental data are presented which provide a psychophysical specification of white, in terms of color temperature, luminance, stimulus area, and duration. White threshold contours for three observers were obtained for five different angular sizes of test field: 2.0, 5.8, 11.7, 23.4, and 46.8° subtended at the eye, and for two exposure durations: 1 second and 5 seconds. The luminance range extended from 3 to 3000 millilamberts. All results were obtained for a neutral state of adaptation. The specific variation in the white threshold with changes in stimulus area is itself shown to be a function of the color temperature of the test stimulus. The major effect of an increase in stimulus duration is an increase in the range of color temperatures which appear white at a given level of luminance. Sources of inter-observer differences are discussed, and the variability of the measurements is shown to be lawfully related to the luminance level. 2 tables, 7 figures, and 17 footnotes. E.S.

SUMMER, W. Colour preference in packaging. Brit. Packer 13, no. 7: 27-30 (July, 1951).

Practical findings of value to package designers concerning the emotional appeal of colors and the color preferences of various types of people are presented. 9 tables, 2 figures, and 9 references. M.W.

COLOR-BLINDNESS

MIDDLETON, W. E. KNOWLES. Choice of colours for identification. Can. Chem. Processing 35, no. 8: 649-51 (August, 1951).

Colors which are used in industry for identification purposes are frequently selected without consideration of possible visual deficiencies of observers. By the use of a cross section of a color space in which the various hues are arranged around a vertical axis of lightness, and in which the distance from the axis represents saturation, a series of colors can be selected which will be identifiable by the two most common types of color-deficient observers (protanopes and deuteranopes characterized by red-green confusion), as well as by normal observers. The most suitable series for daylight and artificial light includes violet, blue, black, white, gray, olive, and yellow. 6 figures. M.W.

CONTAINER INDUSTRY

BOLTON, PHILIP S. Trends in the paperboard industry. Tappi 34, no. 8: 110-12A (August, 1951).

Trends in waste paper, folding cartons, setup boxes, and corrugated and solid-fiber boxes are reviewed briefly. E.S.

CORROSION

MALOY, ROBERT H. Maintenance through protective coatings. Paper Mill News 74, no. 33: 64, 66, 68 (Aug. 18, 1951); *cf.* B.I.P.C. 21: 391.

This is essentially the same as the previous reference. M.W.

COST—ACCOUNTING

MILLARD, J. W. Comprehensive breakdown of delivery costs is essential for efficient operations. Am. Paper Merchant 48, no. 8: 14-15, 46 (August, 1951).

A study of the delivery costs of a wholesale grocery company which was conducted by General Motors Corp. and the Kudner Agency, Inc. is reported. It revealed that the delivery cost of a multiple-unit wholesale grocery company was 1.25% of net sales. Seventeen very large customers accounted for 40% of the total volume, and more than 3500 other customers for the remaining 60%. However, the 17 major customers entailed only 13% of the total expense, or, in terms of net sales, 0.4%. The other customers accounted for 87% of total delivery expense, or 1.8% based on net sales. A breakdown of costs for various routes consisting of small customers provided further evidence that small accounts entail a disproportionately high portion of delivery costs and that much small-order business is handled at a loss. It is suggested that the survey results parallel the situation in the wholesale paper industry. 4 figures. M.W.

SØMME, KNUD. Calculation and production control. Norsk Skogind. 5, no. 6: 166-77, 179-87 (June, 1951). [In Norwegian; English summary]

The author emphasizes the advantages to be derived from a well-developed cost-accounting system in a paper mill for promoting the co-operation of all departments. By means of tabular data the economic results of the sales and production departments in a mill with diversified production are illustrated; the results of the production department are shown by comparison of the standard with actual costs. The reasons for differences are pointed

out. Methods for the calculation of the cost price, the minimum price, and the selection of the most favorable conditions and products are discussed. These methods are based on mathematical-statistical studies and are described in considerable detail. Methods for cost analysis also receive consideration. In conclusion, attention is drawn to the fact that the study of the economic conditions in a mill has thus far been largely neglected, and the co-operation between different mills and between the technical and economic organizations within the industry is recommended. 4 tables and 10 figures. E.S.

COTTON

HALL, LAURA THOMAS, and ELTING, JOHN P. Cavitomic cotton; a progress report. Textile Research J. 21, no. 8: 580-90 (August, 1951).

Damage resulting from micro-organisms occurring in increasing amounts of apparently good spinnable Middling cotton and the effects on mill processing are recognized. Such cottons, called "cavitomic," are distinguished from off-color and field-damaged types. Data and observations supporting a previous publication (*cf.* Science 113, no. 2933: 297-300 [March 16, 1951]), together with methods of observation, are given. The reducing-material content, pH, and metallic-ion content of easily soluble water extracts are discussed, and relationships between them shown. The weakening of the fiber is exhibited by the shortening of staple. Data obtained under both laboratory-controlled and conventional warehouse-storage conditions are given. 1 table, 12 figures, and 17 references. E.S.

MARSH, P. B., GUTHRIE, L. R., and BUTLER, M. L. The influence of weathering and of microorganisms on the aqueous-extract pH of cotton fibers. Textile Research J. 21, no. 8: 565-79 (August, 1951).

Pure-culture laboratory tests which involved inoculation with fungi and humid-atmosphere incubation of fiber and unbleached cotton fabric, followed by pH determinations, indicated that several micro-organisms, including certain types of common occurrence on field-weathered cotton, may bring about rapid pH increases of the same general magnitude as those observed with fiber exposed to humid weather in the field. Both cellulose-decomposing and noncellulose-decomposing fungi produced pH increases, and the data suggest that the increases may be caused by the decomposition of malic and other organic acids in the fiber. The pH test appears to offer promise as a rapid method of fairly wide applicability for detecting the growth of micro-organisms on cotton fiber. The pH change measured is a response to growth on the noncellulosic constituents of the fiber and must be supplemented by further tests if the occurrence of structural damage to the fiber is to be ascertained. 7 tables, 5 figures, and 14 references. M.W.

WHITWELL, JOHN C., LEMISZKA, THEODORE, and HUGHES, VINCENT L. Degradation of cellulose during mechanical processing. Part II. Action of beaters on cotton. Textile Research J. 21, no. 8: 556-64 (August, 1951); *cf.* B.I.P.C. 20: 78.

Previous work on the degradation of cotton during mechanical processing has been extended to include a study of the action of the pickers under various operating conditions. The results indicate that blade and carding beater types cause different amounts of degradation, that the amount of degradation caused by a very close setting can be differentiated from that due to wider spacings, and that the speed of rotation of the beater has a

degradation effect which is detectable only after several passes, i.e., several consecutive picker operations. The effect of consecutive picker operations under similar conditions of the other variables is readily discernible. 4 tables, 2 figures, and 13 references. E.S.

CYMENE

KOBE, KENNETH A., and ROMANS, ROBERT T. Dehydrogenation of *p*-cymene. Ind. Eng. Chem. 43, no. 8: 1755-8 (August, 1951).

Optimum conditions for converting *p*-cymene to *p*, α-dimethylstyrene by catalytic dehydrogenation over a chrome-nickel catalyst are described. Ultimate yields of 50% of substituted styrenes at a conversion of 50% per pass can be obtained. Of the temperatures studied, 1100°F. (593°C.) with a dilution of the *p*-cymene with benzene seems to give the best yields; lower temperatures give poorer yields. The procedure is of interest in view of the recovery of *p*-cymene from the sulfite pulping of certain types of wood and the possibility of producing *p*-cymene from sulfate turpentine. 1 table, 8 figures, and 25 references. H.F.L.

DIE-CUTTING

HOLMGREN, R. B. How to make dies for box manufacturing. Articles 1-8. Boxboard Containers 68, no. 695: 6-8; no. 696: 13-14, 16 (November, December, 1950); 69, no. 697: 19-20, 23; no. 698: 15-16, 67-8; no. 699: 15, 18, 70-1; no. 700: 29, 31-2; no. 701: 44, 46, 49; no. 702: 16, 19-20, 83, 85 (January-June, 1951).

A detailed description of the individual steps involved in diemaking is given. The first article deals with tools, equipment, and supplies; the second, with the preparation of the samples for the customers; the third, with the operations involved from the layout to lockup operations; the fourth, with the actual lockup work (squaring and filling in die, preliminary lockup, checking and measuring, elimination of bows, positioning of plugs in tucks, and final lockup); the fifth, with the process of sample making; the sixth, with the corking of dies; the seventh, with the use of oil sheets and rub-out sheets (which is usually a pressroom function) for verifying registration; and the eighth and final article, with the cleaning, packing, storing, and recording of dies. The articles are profusely illustrated and intended to help box manufacturers attain more efficient use of available manpower. E.S.

SCOTT, M. LEE. "Outside source" can eliminate die department "bottlenecks." Am. Boxmaker 40, no. 7: 24-6 (July, 1951); Am. Pressman 61, no. 10: 29, 50-1 (September, 1951).

The principal impediment to full production in folding-box plants is the die department where exact standards of production are difficult to set because of the highly hand-skilled nature of diemaking. The purchase of one-piece jigged dies to supplement the plant's own supply is recommended when the die department is unable to keep up with the demands of the printing and die-cutting divisions. Jigged dies are accurate, provide a faster make-ready, are easy to store, and last longer. They can be sectionalized and are entirely interchangeable both with other forms or for a new sheet size. By supplying pertinent information to a reliable supplier, jigged dies can be purchased via mail orders. 3 illustrations. M.W.

EVAPORATION AND EVAPORATORS

STORROW, J. ANDERSON. Multiple effect evaporators; design calculations. Parts 1-3. Ind. Chemist 24, no. 278: 174-83; no. 280: 311-15 (March, May, 1948); 27, no. 318: 298-304 (July, 1951).

In the first two articles calculations for the analysis of a balanced operation in quadruple-effect evaporators with forward and backward feeding techniques are presented; the third article deals with successive approximation methods of calculation in the assessment of a balanced operation of a double-effect system where the temperatures differ considerably, and for a quadruple effect with the complication of vapor bleeding between the effects. 11 tables, 6 figures, and 22 references. E.S.

EVAPORATION AND EVAPORATORS—SULFITE WASTE LIQUOR

GENERAL AMERICAN TRANSPORTATION CORPORATION. New evaporator licks effluent woes of pulpers. Chem. Eng. 58, no. 8: 181-2 (August, 1951); *cf.* B.I.P.C. 20: 637.

A new type of evaporator which will be employed to concentrate spent sulfite liquor is described. It is a Conkey flat-plate heating surface evaporator which utilizes the Rosenblad channel-switching system in which the liquor and steam sides of the evaporator are periodically switched so that scaling is prevented. Installations will be made at the following Wisconsin mills: Rhinelander Paper Co., Rhinelander, Hoberg Paper Mills, Green Bay, Consolidated Water Power & Paper Co., Appleton, and Northern Paper Mills, Green Bay. 2 illustrations and 1 flow diagram. M.W.

FIBER—IDENTIFICATION

HOUGHTON, F. D. Microscopy and identification of synthetic fibers. Tappi 34, no. 8: 353-6 (August, 1951).

This paper deals with the simple microscopy of the major synthetic fibers (viscose, acetate, and cuprammonium rayons, nylon, Vinyon, Orlon, and glass), including chemical and staining tests for confirmatory purposes. Other new fibers are omitted because of their infrequent occurrence in the paper industry. 2 tables and 11 figures. E.S.

FIBER—STRUCTURE

FREY-WYSSLING, A. The internal structure of cellulose microfibrils. Makromol. Chem. 6, Staudinger-Festband: 7-14 (March, 1951). [In German; English summary]

The electron microscope shows that native cellulose fibers consist of microfibrils 200 to 300 A. in diameter and of unknown length; x-ray diffraction reveals that the cross section of a microfibril contains approximately 15 to 25 micellar strands. Although the cross-sectional structure is well understood, the longitudinal structure is not. Three possibilities of the arrangement of the crystalline areas and intermicellar spaces in the longitudinal direction are discussed, with special reference to the possibility of cross-sectional splitting of microfibrils by hydrolysis. The author assumes the presence of thin areas or weak bonds which surround the microfibrils, which can be readily penetrated by reagents, and which are more susceptible to hydrolysis. 6 figures and 12 references. E.S.

FLAVOR AND AROMA

BURTON, LAURENCE V. Chemical agents and residues in foods: the viewpoint of the container manufacturer. Food Technol. 4, no. 12: 503-6 (December, 1950).

Changes in the flavor of packaged foods have occasionally been traced to the container. The flavor pickup has been found to be most pronounced in fatty foods but has been encountered in many others. Flavor-control problems which arise in flexible packages or semirigid containers with

paperboard bodies stem from a variety of sources which are obscure and difficult to trace. Some varieties of printing inks and plasticizers, contaminated or musty scrap paper, bactericidal agents used in paper mills to prevent slime bacteria, etc., have been known to be the cause of off-flavors. The prevention of flavor contamination in foods requires the co-operation of the producer of packaged products and the supplier of packaging materials, with particular emphasis on the necessity and importance of providing the latter with the pertinent information on the intended application of his products. M.W.

FOREST FIRES

PEPLER, W. A. E. Some suggestions for reducing fire hazards on our operations. Pulp Paper Mag. Can. 52, no. 8: 115-16 (July, 1951).

The fire hazard of logged-over areas may be minimized by zoning smaller areas of continuous slash. Methods for accomplishing this and some of the considerations involved in choosing a cutting program of this type are discussed. M.W.

SHAUGHNESSY, WM. Radio communications. Pulp Paper Mag. Can. 52, no. 8: 106 (July, 1951).

The usefulness of radio communication for reporting forest fires may be impaired by excessive noise, especially that caused by electric motors and machines. However, through proper installation and maintenance with the use of remotely operated receivers and noise filters when necessary, successful radio communication can be attained. M.W.

FORESTS AND FORESTRY

CANADA PAPER COMPANY. Forest management. Paper Making and Paper Selling 70, no. 2: 22-6 (Summer, 1951).

Following a discussion of the purpose and methods of forest management, the practices carried on at the Windsor Mills woodlot of the Canadian Paper Co. are described. Here selective cutting on a year-round schedule coupled with ready accessibility has helped to effect an increase in the original cutting allowance of almost 50%. In the near future the hardwood logging methods which are practiced should provide conclusions on the economic value of hardwood removal. 5 illustrations. M.W.

PESEZ, G. A. Industry's role as related to New York State's pulpwood supply. Tappi 34, no. 8: 20A, 22A, 24A (August, 1951).

The possibilities for increasing adequate supplies of desirable species of pulpwood in New York State are discussed, including the planting of suitable species, the use of hardwoods and by-products of other wood-using industries, and co-operation with the Conservation Department in forest-fire prevention and insect control. E.S.

SKIFF, J. VICTOR. Public and private forestry get together. Tappi 34, no. 8: 24A, 26A (August, 1951).

The development and enactment of the Forest Practice Act in New York State, as well as its policies and results to date are discussed. E.S.

GROUNDWOOD PULP

BRECHT, W. New methods for evaluating the quality of mechanical pulps. Bull. assoc. tech. ind. papetière 5, no. 4: 169-76 (June, 1951). [In French]

This is a resume of investigations which have been previously described in other publications (*cf.* B.I.P.C. 18: 254-5; 19: 549). 5 figures. L.E.W.

HARD WOODS

O'NEIL, F. W. We have pulpwood in New York State. Tappi 34, no. 8: 26A, 28A, 30A, 32A (August, 1951).

Following statistical data on the pulpwood drain and growth in New York State, the author emphasizes the possibilities of hardwoods as described in European literature and through the application of semichemical and chemigroundwood processes. 4 tables, 6 figures, and 9 references. E.S.

HISTORY

VOORN, H. About Jacob Christian Schäffer; a contribution to the history of paper manufacture in the eighteenth century. Papierwereld 5: 13-69 (Christmas number, 1950); Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 28, no. 1-3: 1-2 (January-March, 1951). [In Dutch; abstract in English]

This historical study on the search of rag substitutes comprises the entire issue and deals particularly with the efforts of Schäffer, Léorier de l'Isle, Senger, and Koops, including historical data, reproductions of title pages, illustrations, and references. E.S.

VOORN, H. The papermaker. Papierwereld 5, no. 4: 148-52 (November, 1950); Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 28, nos. 1-3: 2 (January-March, 1951). [In Dutch; abstract in English]

The author discusses the information which can be gathered about the old craft and equipment used in papermaking from old books on the subject and, particularly, illustrations of the papermaker. 4 reproductions in the original articles. E.S.

INSECTS AND VERMIN

[DÉRIBÉRÉ, M.] Battle against insects. Papeterie 73, no. 6: 317, 319 (June, 1951). [In French]

In addition to the well-known chemical methods used in insect control, the following possibilities are discussed briefly: mechanical operations, temperature, light (white and colored), ultraviolet and infrared rays, electrocution, radar and short waves, ultrasonics, and biological methods. L.E.W.

SPILLER, D. Digestion of alpha-cellulose by larvae of *Anobium punctatum* De Geer. Nature 168, no. 4266: 209-10 (Aug. 4, 1951).

An investigation to determine the amount of α-cellulose digested by the common house borer, *Anobium punctatum*, revealed that about one third of the α-cellulose present in the wood is digested. The question of whether the amount of some substance or substances present in the wood determines the extent to which α-cellulose can be utilized is proposed. 2 tables and 7 references. M.W.

INSTRUMENTATION

MINNEAPOLIS-HONEYWELL REGULATOR COMPANY LIMITED. Colorgraphic panels built entirely in Canada. Can. Pulp Paper Ind. 4, no. 8: 20, 22 (August, 1951).

Two colorgraphic panels which were built at the Leaside plant of Minneapolis-Honeywell have recently been installed in the Saskatchewan Federated Co-operatives' new refinery at Regina. These panels provide maximum process visibility with minimum panel size through the use of new small indicating dials and gages spotted in a flow diagram related by easily identified symbols to actual instruments mounted below. An entire process operation is diagrammed and automatically controlled and measured. 2 illustrations. M.W.

IONOGRAPHY

MCDONALD, HUGH J., URBIN, MATTHEW C., and WILLIAMSON, MARTIN B. Ionography, some aspects of ion migration on paper in an electric field. J. Colloid Sci. 6, no. 3: 236-44 (June, 1951); *cf.* B.I.P.C. 21: 18.

This investigation deals with some of the factors which influence the migration on paper of charged particles in solution in an electrical field; the filter paper used was Eaton and Dikeman, No. 613, 8 mm. wide, in rolled strip form. Descriptions of a number of modifications on the original apparatus are given; these increased the accuracy and reproducibility of the measurements without involving basic changes. The relationships that exist between the mobility of amino acids migrating on paper under the influence of an electric field, and the pH of the solution, the ionic strength, the time, and the voltage across the paper are presented. The rate of migration was found to bear a linear relation to the potential gradient and to the time. The isoelectric points of histidine and glutamic acid were determined to be 7.6 and 3.1, respectively. 7 figures and 9 references. E.S.

LABORATORIES

E. I. DU PONT DE NEMOURS & CO., INC. Du Pont's new paper laboratory. Paper Trade J. 133, no. 8: 40-2 (Aug. 24, 1951); Paper Mill News 74, no. 37: 79-80, 82 (Sept. 15, 1951); Am. Boxmaker 40, no. 9: 23 (September, 1951); Southern Pulp Paper Manuf. 14, no. 9: 22, 24, 70 (September, 1951); Paper Ind. 33, no. 6: 642-3 (September, 1951); Tappi 34, no. 9: 72A, 74A, 76A, (September, 1951); Packaging Parade 19, no. 224: 17, 71, 73-5 (September, 1951); *cf.* B.I.P.C. 21: 880-1.

Du Pont has announced the opening of a new laboratory at Deepwater Point, N.J., which will be devoted to the development of neoprene latex-paper combinations and which will be equipped for pulp testing as related to the use of neoprene, and for the preparation and testing of experimental papers. The addition of neoprene to paper has been found to result in an increase in wet and dry tensile strength, elongation, bursting strength, impact resistance, chemical resistance, folding endurance, and internal bonding strength of the paper. The various properties imparted by neoprene have been found advantageous in the following paper products: multiwall bags, printing paper, filter paper, tray liners, imitation leather, masking paper base, sandpaper base, linoleum backing, meat labels, creped covers, and laminates. (*cf.* also Chem. Week 69, no. 9: 14-15 [Sept. 1, 1951]). 2 illustrations. M.W.

LATEX, SYNTHETIC

STILBERT, E. K., and CLACK, H. L. The properties of a new vinyl chloride—vinylidene chloride latex for paper coating. Tappi 34, no. 8: 337-47 (August, 1951).

A new vinyl chloride-vinylidene chloride latex is described. The properties

of this synthetic latex are outlined. Detailed information is presented on the methods of handling and formulating the latex to obtain useful decorative and protective coatings. Data on the properties of coated papers are presented which indicate that this latex will find wide use as a general-purpose, vinyl-resin coating material. A review of the vinyl chloride-vinylidene chloride copolymer system shows that a latex based on a high proportion of vinyl chloride in the copolymer deposits films with excellent color stability, toughness, and grease, water, and chemical resistance. It can be formulated to obtain a fair degree of moisture-vapor resistance. Such a latex is being made commercially under the name Dow Latex 744-B. This new vinyl copolymer latex possesses excellent mechanical stability; it is widely compatible with water-soluble and water-dispersible materials. Since it does not form a film with simple air drying, special formulating steps are required to obtain useful films. Because of the excellent stability of the latex and compatibility of the polymer, suitable films can be obtained by using a wide variety of modifiers incorporated with standard mixing equipment. 9 tables, 15 figures, and 5 references. E.S.

LIGNIN

LINDGREN, BENGT O. Group B in lignin. Acta Chem. Scand. 5, no. 4: 616-20 (1951). [In English]

According to Erdtman (*cf.* B.I.P.C. 11: 141-2), lignin contains two types of hydroxyl groups which react with sulfite in a different manner. Group A is sulfonated by acid, neutral, and weakly alkaline sulfite and reacts at a higher rate with sulfite than with phenols at a high pH, and at a higher rate with phenols than with sulfite at a low pH, whereas Group B is sulfonated only at a low pH, reacts more slowly with phenols than with bisulfite at any pH, and forms the linkage which binds lignin in the wood. When this linkage is cleaved, Group B is converted into Group B′. Benzyl alcohol and benzyl ethers are not sulfonated at a low pH in the presence of phenols. In a low-sulfonated lignosulfonic acid (I), Group A has been sulfonated, whereas Group B does not react. To investigate this group further, a (I) containing 0.35 atom of sulfur per methoxyl group was heated with bisulfite at pH 1.1 for six hours at 135°C., giving a lignosulfonic acid with 0.52 atom of sulfur per methoxyl group. When the same cook is carried out at pH 1.2 in the presence of 2-naphthol, 0.3 mole of naphthol reacts with (I), whereas at pH 2.3, only 0.06 mole of 2-naphthol enters the lignin molecule, and the sulfur content increases to 0.42 atom of sulfur per methoxyl group. These competitive reactions between sulfite and phenol show that Group B′ reacts as a benzyl alcohol or benzyl ether group. It is suggested that Group B is an *o*- or *p*-alkoxybenzyl alkyl ether group. 2 tables, 1 figure, and 16 references. F.E.B.

LINDGREN, BENGT O. Treatment of spruce lignin with sulphite solutions at pH 4-9. Acta Chem. Scand. 5, no. 4: 603-15 (1951). [In English]

Pre-extracted sprucewood meal was subjected to sulfite cooks at 135°C. for one to 24 hours at a pH varying from 4 to 9, and the sulfonated wood was analyzed for lignin and sulfur. At pH 5-9 and during a heating period of 24 hours, 0.25-0.28 atom of sulfur is taken up, and at pH 4, 0.44 atom of sulfur per methoxyl group. About 50% of the combined sulfur is taken up in the first hour. The loosely combined sulfur dioxide amounts to only 0-0.03 atom of sulfur at pH 4-9. The sulfur content in the isolated lignins increases from 1.63 to 2.41% with a pH increasing from 4 to 8, with a simultaneous decrease of the lignin content from 27.2 to 25.1%. The ratio of lignin to methoxyl varies only slightly (0.12-0.16). Acid hydrolysis of a sulfonated sprucewood containing about 0.3 atom of sulfur per methoxyl group gives a "low-sulfonated lignosulfonic acid" with 0.3 atom of sulfur per methoxyl

group. The small amount of lignin (11-15%) dissolved at pH 6-7 in four hours seems to be bound by a weaker linkage than the remainder of the lignin, as shown by comparative cooks with diveratryl ether (I). A large amount, however, goes into solution on acid hydrolysis of the sulfonated wood, and this dissolution parallels the hydrolysis of the dibenzyl ether linkage of (I). From the results the author concludes that the lignin building stones are combined with each other or with carbohydrates by benzyl ether-like linkages. Lignin preparations prepared under mild conditions have a molecular weight of around 1000, corresponding to about five lignin building stones per lignin-building unit. 2 tables, 8 figures, and 18 references.

F.E.B.

LIME AND LIMESTONE

WALKER, R. S. Operation of sludge recovery kilns. Tappi 34, no. 8: 366-9 (August, 1951).

The construction and operation of rotary kilns for processing sludge from a causticizing system are discussed. E.S.

LUBRICATION AND LUBRICANTS

MILLER, L. W. Applied lubrication in industry. Paper Mill News 74, no. 33: 81 (Aug. 18, 1951).

Because lubrication is not an exact science and is involved with the incompletely known field of kinetic energies, its part in a preventive-maintenance program should be supervised by a lubricant specialist familiar with operating conditions and lubricant characteristics. M.W.

MILLER, WALTER S. Circulating oil system on paper machines. Paper Mill News 74, no. 33: 96, 121 (Aug. 18, 1951); *cf.* B.I.P.C. 21: 20.

Desirable characteristics, from a lubricating engineer's point of view, in the circulating oil systems used on paper machines are discussed. M.W.

MACHINERY

"ESTEVAN." Plant management. Paper Box Bag Maker: 14-15 (July, 1951).

The responsibilities of plant management in decreasing nonproductive hours which result from machine failure are discussed with regard to machine selection, machine location, and machine maintenance. M.W.

MACHINERY—BEARINGS

BRUENING, J. M. Maintenance of antifriction bearings. Paper Mill News 74, no. 33: 76, 78 (Aug. 18, 1951).

In this discussion of proper maintenance of ball and roller antifriction bearings, the importance of protecting the bearings from dirt during installation, use, and storage is emphasized. M.W.

MACHINERY—BLOWERS

SAINT-VAULRY, R. DE. The use of turboblowers in paper machines. Bull. assoc. tech. ind. papetière 5, no. 5: 238-49 (July, 1951). [In French] *cf.* B.I.P.C. 18: 524.

The possibilities and advantages of Sulzer turboblowers in the paper industry are discussed. 15 figures. E.S.

MACHINERY—CALENDER DRIVE

BECK, CHARLES D. Supercalender drives. Paper Trade J. 133, no. 7: 20, 22, 24, 26, 28, 30 (Aug. 17, 1951); *cf.* B.I.P.C. 21: 630.

The author describes the functional and operating fundamentals of supercalenders, their drives and power requirements, and the types of calender drives and their operation. 11 figures. M.W.

MACHINERY—CONVERTING MACHINERY

HAMILTON, GEORGE. Thermoplastic staying. Boxboard Containers 69, no. 702: 8-10 (June, 1951).

A new low-speed quad stayer has made possible a more continuous operation in the production of setup boxes. The new machine, which is used by the Quality Park Box Co., St. Paul, and the Master Paper Box Co., Chicago, fastens corners with thermoplastic stay paper by means of electrically heated irons. Its operation is by remote control with automatic stop-start action, and it can be used to supplement continuity of semiautomatic and fully automatic gluer-wrapper production. It is built to operate with any of the combined gluer-wrapper units at approximately 35 to 40 box pieces per minute. The only disadvantage of the heat-seal stay is the fact that the current shortage of thermoplastic stay paper interferes with production planning. 4 illustrations. M.W.

HOBBS MFG. CO., *Worcester, Mass.* New Hobbs die press is mechanically operated and electrically controlled. Am. Paper Converter 51, no. 8: 14, 16 (August, 1951).

A new "Autotronic" die press is described which has an automatic powered table motion and a number of new safety features. A photoelectric cell control starts the head action after a predetermined interval and also stops the head if any obstruction, such as the operator's arm, interrupts the light beam after the die is in position. An electric clutch operates the mechanical flywheel type of action, and a microswitch overload control is employed. 2 illustrations. M.W.

MACHINERY—DRIVE, ELECTRIC

METROPOLITAN-VICKERS ELECTRICAL COMPANY, LIMITED. "Metrolock" speed control for paper machine drives. Paper-Maker (London) 122, no. 1: 23-4, 26 (July, 1951).

The principle of operation, apparatus required, and some applications of Metrolock control are described; although the system is not confined to paper-machine sectional drives, it is especially suitable for this purpose. The basis of the scheme is the direct coupling of a tachometer-type generator to the driving motor and the electronic amplification of these generator signals to secure high accuracy and sufficient power. Smooth stepless control of speed is provided, and variable-speed gears are eliminated. The system permits remote control from the most convenient operating position or centralized control from a desk where other controls may also be located. 6 figures. E.S.

MACHINERY—DRYERS

ANON. The Carpenter rotary steam joint. Pulp Paper Mag. Can. 52, no. 8: 98-9 (July, 1951).

The details, installation, maintenance, and advantages of the joint (of ball-bearing construction) are described; it is designed to meet the requirements resulting from higher paper-machine speeds. More efficient condensate removal and power savings are claimed for the device. Two paper machines

at the Wayagamack Division of the Consolidated Paper Corp. Ltd. have been completely fitted with these joints, and three more machines are in the process of being equipped. 2 figures. E.S.

MACHINERY—ELECTRIC EQUIPMENT

CROCO, C. P. Motor control—rotating, electronic, and magnetic. Paper Trade J. 133, no. 6: 24, 26, 28, 30 (Aug. 10, 1951).

The mechanical fundamentals which effect speed regulation are discussed, and the following devices for adjusting the speed of a d.c. motor are described and compared: a rheostat, a separate motor generator, separate exciters, a Rototrol rotating regulator, electronic regulators, and magnetic amplifiers. 1 table and 10 figures. M.W.

HAPP, E. L. Why better maintenance means better paper. Paper Mill News 74, no. 33: 44, 46, 48 (Aug. 18, 1951); Southern Pulp Paper Manuf. 14, no. 8: 32, 34, 36, 58 (August, 1951).

Some of the important features of a preventive maintenance program for electrical equipment are described. These include a simplified system of keeping records on stock cards of all pertinent information concerning a machine, hand packing of bearings rather than pressure lubrication, the proper selection of equipment, well-equipped maintenance facilities, and an efficient safety program. M.W.

VREUDENBERG, A. J. Better maintenance by better machine design. Paper Mill News 74, no. 33: 40, 42 (Aug. 18, 1951); *cf.* B.I.P.C. 21: 704.

This is the same as the previous reference. M.W.

MACHINERY—PACKAGING MACHINERY

ANON. Fully automatic manufacture of bag packages. Allg. Papier-Rundschau no. 10: 408-10 (May 22, 1951). [In German]

Reference is made to two machinery systems for the automatic packaging of products in bags. In one, the bag is formed on the machine from either roll or sheet, filled, and closed, whereas in the second type the finished bags are taken from a pile, filled, and closed. The advantages of either system and the important technical and economic factors in their selection are discussed. 4 figures. E.S.

MACHINERY—PRESSES

RIESS, K., and MESKAT, W. Screw presses for processing viscous and plastic masses. Chemie-Ingenieur-Technik 23, no. 9/10: 205-12 (May, 1951). [In German]

The fundamentals and characteristics of screw presses are discussed, which frequently combine the functions of batch-type equipment, such as mixers, kneaders, kollergangs, disintegrators, hydraulic presses, etc., in one continuous operation. Their application to the pressing and defibering of alkali cellulose in the rayon industry is described. Mention is also made of recent developments in screw presses. 2 tables, 35 figures, and 12 footnotes. E.S.

MACHINERY—PULLEYS

SNARTEMO, J. H. Help yourself to faster V-belt drive deliveries. Paper Mill News 74, no. 33: 54, 56 (Aug. 18, 1951).

The selection of stock sizes of V-belt sheaves whenever possible will minimize any replacement problems and delays. 1 table and 3 illustrations. M.W.

MACHINERY—PUMPS

GLADDING, W. L. Maintenance of pumps. Paper Mill News 74, no. 33: 100, 108-9 (Aug. 18, 1951).

Directions for the maintenance of pumps are presented under the following headings: preparing pump for operation, stopping and securing, failure to build up pressure, lubrication, and lantern rings. M.W.

MACHINERY—REFINERS

RENARD, A. The pseudo-continuous refining process. Rev. papiers et cartons 14, no. 12: 335-7 (July 1, 1951). [In French]

The Shartle-Dilts system with a Hydrapulper, Hydracycle chests, and Hydrafiners and jordans connected in series presents the most modern stock-preparation technique for daily productions of at least 12 to 20 tons. However, it is too complicated for small outputs of two to six tons per day; for such cases the author outlines an economical solution involving only one Hydrafiner and one jordan, in addition to the Hydrapulper and Hydracycle chests. Although no installation of this type has yet been made, it offers an interesting possibility for small mills. Its only grave disadvantage is the fact that the accidental breakdown of either Hydrafiner or jordan will result in the shutdown of the entire mill. 1 figure. E.S.

SMALL, THAXTER W., JR. Semichemical pulping with single rotary disk refiners. Tappi 34, no. 8: 105-8A (August, 1951); *cf.* B.I.P.C. 21: 629.

The single-disk Sprout-Waldron refiner is described, with particular reference to model 36-2 as used for semichemical pulping. 2 tables, 3 figures, and 1 reference. E.S.

TEXTOR, CLINTON K. Semichemical pulp production with revolving disk mills. Tappi 34, no. 8: 92A, 94A, 96-102A (August, 1951); *cf.* B.I.P.C. 21: 707.

The Bauer double- and single-disk refiners are described in detail, and the performance of disk mills is discussed by grouping it into the three categories: fiberizing, strength development, and dispersing. Typical applications are outlined. 4 illustrations. E.S.

MACHINERY—SAWS

FOSLIE, MICHAEL. Cut-Control circular saw blades. Norsk Skogind. 5, no. 7: 213-16 (July, 1951). [In Norwegian]

The advantages of Cut-Control circular saws (Wiggo-RS-Blatt) are discussed, particularly their safety features in reducing the kickback problem. 2 figures and 12 references. E.S.

MACHINERY—SCREENS

DOWNS, HENRY W., JR. Slotted screen plates for pulp and paper mills. Tappi 34, no. 8: 380-2 (August, 1951).

A brief description of the development, design, and installation of slotted screen plates is given. 2 figures. E.S.

WARREN, B. D. How to keep your cylindrical screens at their best throughout the emergency. Paper Trade J. 133, no. 9: 24-7 (Aug. 31, 1951).

The author discusses the proper maintenance for Bird rotary screens. 6 figures. M.W.

MACHINERY—SLITTERS AND WINDERS

ANON. Increase in efficiency in rewinders and cross cutters. Allg. Papier-Rundschau no. 10: 415-16 (May 22, 1951). [In German]

Reference is made to the higher speeds at which postwar machinery (winders, slitters, cross cutters, and coating machines) built by Jagenberg-Werke A. G. are operating. 2 illustrations. E.S.

MACHINERY—STUFFING BOXES

HEMPHILL, J. W. Packing specifications for pulp and paper mills. Paper Mill News 74, no. 33: 70, 72, 74 (Aug. 18, 1951); *cf.* B.I.P.C. 21: 407.

This is essentially the same as the previous reference. 4 figures. M.W.

MACHINERY—SUCTION ROLLS

SMITH, L. E. How to prolong the life of water removal equipment. Paper Trade J. 133, no. 8: 26, 28, 30, 32 (Aug. 24, 1951).

Suggestions are presented for improving maintenance and prolonging the life of the following equipment: plain extractor units; suction extractor units; suction couch, drum, and press rolls; rubber-covered rolls; and suction felt rolls. The importance of adequate and proper lubrication of this equipment is emphasized. 8 illustrations. M.W.

MACHINERY—VORTRAP

LLET. The Voith pipe centrifuge. Wochbl. Papierfabr. 79, no. 7: 179-81 (April 15, 1951). [In German]

The construction and operation of the pipe centrifuge are described which is manufactured by Voith and works according to the same principle as the American Vortrap. It is particularly suitable for the removal of specifically heavier impurities from waste-paper stock; its efficiency depends upon its correct installation in the system (after removal of coarse impurities), pressure, and dilution. The loss in acceptable fibers is negligible. 2 diagrams. E.S.

MATERIALS HANDLING

GALLOWAY, R. S. Movement of pulpwood, chips, coal, lime, and rolls of paper. Southern Pulp Paper Manuf. 14, no. 8: 52-4, 56-7 (Aug. 15, 1951).

The handling of pulpwood, chips, limestone, hot lime, rolls of paper, and coal by Link-Belt conveyor equipment at the Coosa River Newsprint Co., Coosa Pines, Ala. is described. 1 flowsheet and 15 illustrations. M.W.

THE MERCURY MANUFACTURING COMPANY, *Chicago.* How to increase fork truck hoisting speeds. Paper Trade J. 133, no. 7: 30, 32 (Aug. 17, 1951).

Since lifting speeds of battery-powered fork trucks are almost directly proportional to the impressed voltage for a given load, the economics of a

higher-voltage power source should be investigated when an increase in the capacity of existing equipment is considered advisable. 1 table. M.W.

WHITEHURST, GRAHAM. Unitizing for profit. Am. Paper Merchant 48, no. 8: 18, 42-4 (August, 1951); *cf.* B.I.P.C. 21: 855.

Labor costs of handling various paper products as individual cases and as unit loads are compared, and the figures show the significant labor-cost reductions which can be effected through the use of unit loads. 3 illustrations. M.W.

MATERIALS OF CONSTRUCTION

ANON. Versatile material for engineers; uses of "Tufnol" in the paper industry. World's Paper Trade Rev. 135, no. 26: 1876, 1878 (June 28, 1951); *cf.* B.I.P.C. 10: 22.

Tufnol is a laminated, synthetic resin-bonded material made with a paper, fabric, or asbestos base; it is strong, yet light, only half the weight of aluminum. It is widely used for gear wheels and bearings, particularly in situations involving the immersion in water or where very little lubrication can be provided. Users of Tufnol suction box covers have reported better wearing qualities and longer periods of operation without resurfacing, lower power consumption, and elimination of streaking. 2 figures. E.S.

KLOUMAN, G. H. Continuous service with low maintenance costs. Paper Mill News 74, no. 33: 60-2 (Aug. 18, 1951).

Recommendations for the proper maintenance of stainless steel and some suggested uses for it in paper mills are presented. 5 illustrations. M.W.

METERS AND RECORDERS

LEEDS & NORTHRUP COMPANY, *Philadelphia.* Continuous record of waste concentration conserves costly zinc chloride. Chem. Processing 14, no. 8: 76-7 (August, 1951).

Reference is made to a conductivity recorder installed in the waste line from the evaporator of a vulcanized-fiber manufacturing process for checking the concentration of zinc chloride flowing to the sewer; if the concentration becomes too high, the operator reduces the evaporation rate or vice-versa. The particular company estimates a saving of almost $1000 per month in chemical cost since starting this method of instrumentation in place of the previous determination by taking periodic grab samples. 1 flowsheet and 1 figure. E.S.

PRINTING, PACKAGING AND ALLIED TRADES RESEARCH ASSOCIATION. Drops suffered by packages in transit. Paper Box Bag Maker: 13 (July, 1951); Brit. Packer 13, no. 7: 35 (July, 1951).

PATRA packaging research has developed an impact recorder which will record the number of times a package is dropped during shipment. It measures and records drops from 3 inches to 3 feet, but in one direction only; however, it is small in size and inexpensive, so that several can be enclosed in one package. Experiments with the recorder are under way at the present and should provide data of great value in estimating the type and quantity of packing necessary for various kinds of journeys. 1 illustration in the second reference. M.W.

WESTON ELECTRICAL INSTRUMENT CORPORATION. *Tagliabue Instruments Division.* New Tag-Weston stretch meter records

speed ratio changes. Paper Making and Paper Selling 70, no. 2: 26 (Summer, 1951).

The Tag-Weston recording speed-ratio tachometer provides a continuous record of the percentage stretch or shrinkage of materials, including textiles, paper, plastics, rubber, chemicals, and metals, which are processed through pairs of rolls turning at different speeds. The ratio meter and recorder can be calibrated in percentage of stretch, inches per yard shrinkage, percentage of reduction, or other units which are a function of the speed ratio between two rotating members. 2 illustrations. M.W.

MICROBIOLOGICAL TESTING

NIETHAMMER, A., and WOLLNY, B. A. Investigations on aerobic, cellulose-decomposing micro-organisms. Holz Roh- u. Werkstoff 9, no. 6: 213-16 (June, 1951). [In German]

The authors describe the isolation from horse manure and soil samples and the growth of aerobic micro-organisms which can utilize cellulose as the source of their carbon requirements and which are also able to decompose it. Species of *Trichoderma, Fusarium, Cladosporium, Verticillium,* and *Penicillium* were found among the fungi, co-existent with bacteria, among which the species *Cytophaga* and *Cellulomonas* predominated. Filter paper, straw, Tylose (water-soluble methylcellulose), and spent sulfite liquor were used as substrates and found suitable in all cases. All cultures developed well on them, including *Cytophaga,* which had been believed to be specific for cellulose. The addition of certain metal salts may promote fungus growth. X-ray studies of the decomposition of the filter paper showed that the degradation proceeds uniformly and not in a preferential direction, which indicates that the micellar structure of the cellulose is not destroyed by the organisms in the samples under investigation. The x-ray pictures also permit the evaluation of the intensity of attack by different species; the decomposing ability of bacteria is, in general, superior to that of the fungi. 4 tables, 5 figures, and 6 references. E.S.

MILL MANAGEMENT

ANON. What to tell your new employees. Paper Ind. 33, no. 5: 520 (August, 1951).

Suggestions for an instruction sheet for new employees are given in which 20 points are outlined to which he or she can refer when in doubt on a specific point. To this basic information (compiled from many employee guides) should be added others which are peculiar to the individual operation. E.S.

HRUBECKY, GEORGE. Practical ideas for paper mill maintenance. Paper Mill News 74, no. 33: 37-8 (Aug. 18, 1951); *cf.* B.I.P.C. 21: 632.

This is essentially the same as the previous reference. M.W.

MCCULLOUGH, H. G., and BEALE, H. D. Productive maintenance—a program for industrial mobilization. Paper Trade J. 133, no. 9: 23-4 (Aug. 31, 1951).

General Electric's productive maintenance program, which is designed to overcome unscheduled breakdowns of equipment by providing planned outages, consists of the following features: a staff of trained maintenance men, an adequate supply of modern tools and instruments, regular routine checks,

planned outage of equipment for rebuilding and modernizing, and a good stock of mechanical and electrical spare parts. M.W.

MORRIS, DURWARD M. Employee training pays dividends. Am. Boxmaker 40, no. 8: 23, 26-7 (August, 1951).

To insure the best employer-employee relations, an employee must understand the relationship of his particular job to the company as a whole, and the importance of the company in the social and economic status of the community. The employer is responsible for promoting this understanding through education and training. As a preliminary step, certain standards should be established which a prospective employee must meet before being hired. Then a training program which includes some form of job descriptions and job evaluation, a breakdown of each job to determine the most efficient manner of carrying it out, qualified instructors, and records to determine the progress of trainees should be maintained. Foremen occupy a key position in industrial relations and should be informed of company policies and trained to carry them out at the worker level. M.W.

RENARD, A. Productivities and yields in the paper industry. Papeterie 73, no. 6: 306-7, 309 (June, 1951). [In French]

"Over-all productivity" is defined as the quotient obtained by dividing a unit relating to the finished product by the man-hours required to manufacture that unit. The term "yield" applies to all measurable elements contributing to the creation of the unit of the new product. The unit used is 100 kg. of the finished paper to be placed on sale. The partial or individual productivities include the five phases: pulping, refining, manufacture on the paper machine, finishing, and converting. The application of these various operations to the productivity and yields in a small, modern paper mill are discussed, as well as the factors leading to wide variations in productivity obtained by different mills. 1 diagram. L.E.W.

WERLY, B. M. Inspection procedures and frequencies. Paper Mill News 74, no. 33: 50 (Aug. 18, 1951).

The author presents a summary of the preventive maintenance program of the Kodak Park Works of Eastman Kodak Co. M.W.

MOLECULAR WEIGHT

HAAS, H., and TEVES, D. Molecular-weight distribution in technical pulps. Makromol. Chem. 6, Staudinger-Festband: 174-90 (March, 1951). [In German; French summary]

Eleven sprucewood (I) and five beechwood (II) pulp samples were nitrated by the method of Staudinger and Mohr (*cf.* B.I.P.C. 8: 135), and the nitrates were subjected to fractional precipitation, using the technique of Wannow and Thormann (*cf.* B.I.P.C. 20: 166); special precautions are described which were taken to obtain homogeneous fractions and avoid degradation. Losses resulting from a neglect of these precautions, particularly in the low-molecular weight range, may lead to considerable errors in the results. The viscosities of the fractions were determined, their D.P.'s calculated according to the equation of Hess and Philippoff (*cf.* B.I.P.C. 7: 320), and the integral and differential distribution curves of the fractions were plotted. In the carefully isolated products, (I) showed two maxima in the D.P. range of 2000 to 3500, and (II), one maximum at a D.P. of 3300; both showed a polyose (hemicellulose) maximum at approximately a D.P. of 100. During a technical sulfite cook for dissolving pulp, the D.P. of the highest-molecular weight fraction decreased from approximately 4000 to

3000. Most of the material fell within the D.P. range of 200 to 2000 and showed a definite minimum in the case of pulps prepared under mild conditions. The distribution within this range was very homogenous in some cases; sometimes a new maximum was formed. (II) showed a maximum in each case which, with increasing degradation, shifted toward the low-molecular weight ranges. The degradation during the pretreatment of the pulp prior to xanthation led to a considerably more uniform material. It was also found that the weight average could be obtained from the viscometric D.P. determination of the unfractionated material if based on the equation $K_m = 8.4 \times 10^{-4}$. 3 tables, 23 diagrams, and 46 footnotes. E.S.

NEWSPRINT

TIPKA, VERNON L. Newsprint review. Pulp & Paper 25, no. 7: 162, 164, 166 (June 30, 1951); *cf.* B.I.P.C. 21: 475.

Excerpts from the previous reference are given with accompanying statistics on newsprint production, supply, and consumption for the world, the United States, and Canada. A list of U. S. companies which produce newsprint is appended. 11 tables and 4 illustrations. M.W.

PACKAGING

ANON. Igloo for ice cream. Modern Packaging 24, no. 12: 72-4 (August, 1951).

Approximately one-hour protection against melting is provided for consumer-packaged ice cream by new self-insulating cartons now in use by several producers. The package structure consists of a standard linerless carton, an insulating corrugated sleeve, and a printed waxed paper overwrap which has the special coating originally developed for frozen-food packages. 3 illustrations. M.W.

ARP NURSERY COMPANY, *Tyler, Texas.* Protection, identification, appeal combined in this rose bush package. Packaging Parade 19, no. 223: 74 (August, 1951); Paper Box Bag Maker: 17 (July, 1951).

A special duplex bag with a siftproof bottom construction has been developed by the Union Bag and Paper Corp. for packaging rose bushes. The outer sheet with over-all printing offers product identification, whereas an asphalt paper liner insures the necessary product protection and, in combination with the special bottom construction, reduces moisture loss to a minimum. The roots and moss are compressed, shaped, and packaged automatically by a specially designed machine. 3 illustrations. M.W.

COLEMAN CO., *Wichita.* Packaging. Modern Ind. 22, no. 2: 52-5 (August, 1951).

A packaging program which was developed by Coleman to reduce costs and increase product protection is described. The basic technique of the program comprises four steps in which detailed drawings are made and cost charts prepared for each unit of packaging materials, each packaging operation is analyzed to discover waste, new methods are developed and proved by performance tests and, on the basis of the data thus obtained, innovations are recommended to management. Some of the savings which were effected by the application of this method are mentioned. 9 illustrations. M.W.

E. I. DU PONT DE NEMOURS & CO., INC. New packaging method

for photographic sheet film. J. Franklin Inst. 252, no. 2: 214 (August, 1951).

Du Pont's photographic sheet film is now being packaged without the usual black interleaving paper between sheets of film. Preliminary tests with this packaging method showed that the film is cleaner, quicker and easier to handle, and will stand up under prolonged storage. M.W.

THE MCCABE PAINT & VARNISH CO., *Irvington, N.J.* Dissolving package. Modern Packaging 24, no. 12: 88-9 (August, 1951).

Tint-A-Matic paints are merchandised as cubes of semisolid concentrates which are added to a base paint at the time of purchase in the retail store. The cubes are wrapped in a specially formulated transparent film which is soluble in the base paint. A glassine overwrap protects the cubes during handling and shipment. The outer carton consists of a cellophane-wrapped, vinyl-coated carton of special construction embodying the self-baling principle (i.e., opening out flat after one flap is released). The soluble unit provides for a high accuracy of formula in matching colors for consumers and permits the dealer to stock a complete paint department in a 3 × 5-ft. display unit. 5 illustrations. M.W.

RIDGWELL, E. G. O. Packaging electrical products. Brit. Packer 13, no. 7: 23-5, 42 (July, 1951).

Packaging which serves as a protection to the product during handling and shipment rather than as a sales device is considered as it is carried out at General Electric, Schenectady. The interdependence and integration of purchasing packaging materials, package design and research, and handling in successfully minimizing packaging costs are discussed, and the author suggests ways in which G.E. methods can advantageously be incorporated into British packaging techniques. 3 illustrations. M.W.

PAPER—COATED

ANON. Agreement established by the technical commission composed of manufacturers of base papers for coating and producers of coated papers. Papeterie 73, no. 5: 257, 259 (May, 1951); Rev. papiers et cartons 14, no. 10: 277-9 (June 1, 1951). [In French]

A technical commission formed by members of both manufacturing groups established the essential requirements which a suitable base paper for coating should possess. The following factors received consideration; they are listed in the order of their importance: cleanliness of the stock, flatness, dimensional stability, breaking length, sizing, porosity, moisture content, uniform thickness and basis weight, uniform winding of the rolls, permissible stretch in the machine and cross-machine directions, and finish and grain. E.S.

PAPER—MERCHANDISING

ANON. The Bonnie Bee Supermarket—where a paper department means $$. Am. Paper Merchant 48, no. 8: 16 (August, 1951).

Sales volume increases of paper products after a paper department was established in the Bonnie Bee Super Food Mart, Melrose Park, Ill., are listed to furnish proof that paper departments increase sales in a retail establishment if attractively displayed and properly merchandised. 1 illustration. M.W.

PAPER—PACKING

ANON. The A B C of paper and board. Papetier 5, no. 6: 45-7 (June, 1951). [In French]

The author describes the usual French methods of shipping paper in rolls and reams, with reference to the sizes most commonly employed. A number of individually wrapped reams are usually protected by several layers of waste paper and tied securely into bales which, in turn, are protected by wooden frames; sometimes wooden pallets are employed, in which case the reams are wrapped in strong waterproof paper and tied by steel strapping. Plain boxes are seldom used. The mills ship in general either in bales or crates which are well stowed in open railroad cars, covered first with straw and then with tarpaulins; the crates are returned to the mills. E.S.

PAPER—PERMANENCE

BUYN, K. E. C. Paper permanence. Bull. assoc. tech. ind. papetière 5, no. 5: 231-8 (July, 1951). [In French]

Following a discussion of the principal chemical components of the cellulosic fiber, the author outlines the most satisfactory techniques in the manufacture for insuring durability of paper. The fibers should be kept as nearly intact as possible, retaining the "pure" α-cellulose. Refining should be held to a minimum. The resins used should be cationic, and only volatile organic acids should be employed to obtain the required acidity in emulsions. In the storage of paper, light (especially ultraviolet light) and heat are to be avoided, and a 55-60% R.H. is recommended; in no case should the humidity drop below 40%. The deleterious effects of smoke, dust, and rodent and insect attack are also mentioned. 10 figures. L.E.W.

PAPER AND PULP INDUSTRY

CAMPREDON, J. The newsprint crisis cannot be solved unless a better utilization of the French hardwood resources is realized. Papetier 5, no. 7: 45-6 (July, 1951). [In French]

The possibilities of a better utilization of the French hardwoods is possible, and several organizations are working on the solution of the technical difficulties. The major problem today is a financial one: that of interesting the necessary capital investment into the construction of new mills whose cost is at present admittedly high; however, it is the only solution and will, in the long run, serve the best economic interests of France. E.S.

JOSEPHSON, H. R. The possibilities for expansion of the pulp and paper industry in the United States and Alaska. Tappi 34, no. 8: 58A, 60A, 62A (August, 1951).

Possibilities for expansion of the pulp industry are analyzed in terms of pulpwood and water resources in the different sections of the country. E.S.

PULP & PAPER. U. S. agencies. Pulp & Paper 25, no. 7: 154 (June 30, 1951).

Officials of the Pulp, Paper and Board Division of the National Production Authority, the Machinery & Equipment—Controlled Materials Plan, the Forest Products Division of the Office of Price Stabilization, the Economic Co-operation Administration, the Food and Agriculture Organization of the United Nations, and the U. S. Forest Service are listed. M.W.

PULP & PAPER. What's doing in Maine. Pulp & Paper 25, no. 9: 37-9 (August, 1951).

Forestry conditions and pulpwood supplies, including the foundation of the Penobscot Experimental Forest, mill improvements, the sulfur situation, and educational developments in Maine are reviewed briefly. 1 map and 4 illustrations. E.S.

PULP & PAPER. Worldwide review. Pulp & Paper 25, no. 7: almost the entire issue (June 30, 1951); *cf.* B.I.P.C. 20: 881-2.

A summary and statistics of the pulp and paper situation throughout the world are presented. The following sections are included: North America (Stevenson, Louis T. The United States, p. 77-9, 81, 143; Anon. Canada, p. 82-3, 168, 172, 174); Europe (United Kingdom, Eire, Sweden, Finland, Norway, Denmark, France, Spain, Portugal, Netherlands, Belgium, Switzerland, Austria, Italy, West Germany, Greece, and Russia and Communist Europe), p. 85-6, 88-9, 91-2, 94-6, 98, 100, 103, 106; Latin America (Brazil, Mexico, Argentina, Peru, Chile, Guatemala, and the rest of America), p. 108, 110, 112, 114, 116; Asia (Japan, China-Formosa, India, Pakistan, The Philippines, and the rest of Asia), p. 116, 118, 120, 122, 124; Oceania (Australia and New Zealand), p. 124, 126; Africa (South Africa, French Africa, and the rest of Africa), p. 128, 130. Tables and illustrations accompany most of the articles. In addition, statistical information on the different branches of the industry is scattered throughout the issue. M.W.

UNION DES IMPORTATEURS DE PÂTES À PAPIERS. The French paper industry from 1949 to 1951. Papeterie 73, no. 7: 366-7, 369, 371, 373, 375, 377 (July, 1951); Rev. papiers et cartons 14, no. 14: 399, 401-5 (Aug. 15, 1951). [Abridgment] [In French]

This is a statistical and economic study of the trends in the French paper industry during the period covered. 11 tables in the first and 4 tables in the second reference. E.S.

UNION DES IMPORTATEURS DE PÂTES À PAPIERS. The importance of the United States and Canada in the paper economy of the world. Papeterie 73, no. 5: 238, 241, 243, 245, 247, 249, 251, 253 (May, 1951); Rev. papiers et cartons 14, no. 11: 303-5, 307-8 (June 15, 1951). [Abridgment] [In French]

Supplemented by statistical data, the pulp and paper industry of the United States and Canada, individually and as a single economic unit, is discussed, as well as the slight chances which the European paper industry has for relief of its pulp and paper shortage from that direction. 13 tables in the first and 8 tables in the second reference. E.S.

VINCENT, REX. Non-paper cellulose; rayon, cellophane, plastics, etc. Pulp & Paper 25, no. 7: 134, 136, 138, 140 (June 30, 1951); *cf.* B.I.P.C. 20: 882.

The author discusses North American production and consumption of dissolving pulp in the rayon, cellophane, plastics, and miscellaneous industries. 9 tables and 1 figure. M.W.

PAPER AND PULP INDUSTRY—EXHIBITS

ANON. Report on paper. Paper Making and Paper Selling 70, no. 2: 30-6 (Summer, 1951).

A review of the history of papermaking in England up to 1850 (which constituted a part of the Great Exhibition of 1851) is reproduced. 4 tables and 2 illustrations. M.W.

KING, GEORGE J. S. Paper and printing in the Great Exhibition. Paper Market: 17-18 (July, 1951); Paper-Maker (London) 122, no. 2: 88 (August, 1951).

Some of the outstanding exhibits of the Great Exhibition of 1851, including papermaking machinery, examples of typography and papier-mâché, and specimens of type founding are described. M.W.

PAPER AND PULP MILLS

BOWATER PAPER CORPORATION. The expanding Bowater umbrella. Pulp Paper Mag. Can. 52, no. 8: 54-61 (July, 1951).

Following a brief review of the industrial career of Sir Eric Bowater, chairman of the Bowater organization, to whom credit is given for developing it into the largest paper corporation in the Commonwealth, the various mills and associated industries which comprise the organization are described. The location, size, source of raw materials, and production data for these mills are given. Statements and opinions of the chairman on the organization, economic conditions, wood pulp supply, and future expansion of the corporation are also presented. 1 map and 9 illustrations. M.W.

PULP & PAPER. Expansion programs in United States. Pulp & Paper 25, no. 7: 176 (June 30, 1951).

A list of projected new mills or major mill expansion is presented. M.W.

PULP & PAPER. A visit to Colorado. Pulp & Paper 25, no. 9: 32, 34 (August, 1951); *cf.* B.I.P.C. 19: 281-2.

Reference is made to the present status of the control project of the bark-beetle infested Engelmann spruce area in Colorado; spraying the trunks with *o*-dichlorobenzene was found an effective, although rather expensive and hard-to-obtain means of control. Some of the beetle-killed timber is now being shipped to the Consolidated Water Power & Paper Co. of Wisconsin Rapids, Wis., in 8-ft. lengths; it has proved entirely acceptable in the production of pulp, particularly when the chips are mixed with those of green wood. Directors of the Columbine Development Co., promoters of a projected bleached sulfate mill based on the use of beetle-killed timber, recently voted to exercise their option on a 176-acre site selected for the mill-to-be at Newcastle, Colo., about 130 miles west of Denver. The process to be employed was developed at Madison and calls for the addition of chips from green lumber which will be furnished by the Forest Service throughout the life of the Columbine contract, which is for a period of 30 years. Spruce timber from a beetle infestation in Utah 30 years ago was tested and found to yield excellent pulp; it is therefore expected that the present infested wood will be good for pulp manufacture for that period. 1 map and 2 illustrations. E.S.

THE TITAGHUR PAPER MILLS COMPANY LTD. "Another addition to the Titaghur family." Indian Print & Paper 16, no. 67: 30-1 (April, 1951).

Coated papers and boards which are manufactured by the Champion process on a new machine have been added to the range of paper products made by Titaghur Paper Mills. Some scenes from a documentary film, "The Paper Industry in India," are reproduced. 5 illustrations. M.W.

TRIBENI TISSUES, LTD. New West Bengal mill begins production. Indian Print & Paper 16, no. 67: 34 (April, 1951); World's Paper Trade Rev. 136, no. 3: 150, 152 (July 19, 1951).

The new enterprise of Tribeni Tissues, Ltd., originated and fostered by

Balmer Lawrie & Co., Ltd., has started production of cigarette paper from hemp and seed flax. Power for the mill, which is located about 30 miles from Calcutta, is provided by a 3000-kw. turbogenerator with Babcock & Wilcox water-tube boilers. The two paper machines were built by Thiry and Co., Belgium. 3 illustrations. M.W.

PAPER RULING

DAY, FREDERICK T. Paper conversion and usage. No. 12. Ruling and bookbinding work. World's Paper Trade Rev. 135, no. 25: 1838-40 (June 21, 1951).

Ruling work calls for a suitably sized paper which is free from defects which might interfere with the smooth running of the work on the machine; in addition, the paper should be well finished, because greasy surfaces may cause the ruling pens to skip, resulting in broken or disconnected lines. The considerable variety and volume of ruled work involves a large tonnage of paper from medium to high quality. A brief outline of the bookbinding process is also included in the article. 7 illustrations. E.S.

PAPER SPECIALTIES

ÅKERLUND & RAUSING, *Lund*. Milk in paper; a revolutionary Swedish invention wins the world. Svensk Papperstidn. 54, no. 13: 465-6 (July 15, 1951). [In Swedish]

A brief description is given of the "Tetra Pak," a paper milk package in the form of a tetrahedron made of bleached kraft paper, coated with a heat-sealing plastic which is odor- and tasteless and renders the package grease- and oilproof. The advantages of the light, sanitary package in the distribution of milk are emphasized. 3 illustrations. E.S.

ANON. Paper substitutes during the coated art famine. Paper Making and Paper Selling 70, no. 2: 28-9 (Summer, 1951).

The properties and characteristics which make them suitable as substitutes for coated art paper in letterpress printing with halftone illustrations are considered for the following: mat art (particularly creamy mat art) papers; the imitation art, lithographic papers; pure sulfite supercalendered printing papers; imitation Japanese vellums; and plan (i.e., for map printing) and glazed creamy cartridges. For offset printing the esparto cartridges are suggested, and for gravure work, creamy or white supercalendered papers. Generally the choice of a substitute will be governed by the screen of the blocks and the type to be used. 1 illustration. M.W.

ANON. Printers' paper problems. XVI. Paper for block printing. Indian Print & Paper 16, no. 67: 65 (April, 1951); *cf.* B.I.P.C. 21: 637.

Line blocks and woodcuts can be printed on practically any kind of printing or writing paper, but the most artistic effects are obtained when the paper has a mat surface. For halftone printing, imitation art papers are recommended, although supercalendered papers made from pure chemical wood pulps or less than 30% mechanical pulps will also provide satisfactory results. M.W.

BAUER, OSKAR. The manufacture of water- and greaseproof papers; a review of the recent patent literature. Allg. Papier-

Rundschau no. 8: 294-7; no. 10: 402-7 (April 24, May 22, 1951). [In German]

The patent literature on the subject is reviewed under the subdivisions: natural and synthetic resins, metallic soaps, waxes, latex and other rubber derivatives, cellulose derivatives, silicate compounds, proteins, and improvements in machinery. 77 references. E.S.

BERNSTEIN, I. M. Photomicrography of printing paper surfaces. Am. Ink Maker 29, no. 8: 30-3, 64-5 (August, 1951); Modern Lithography 19, no. 8: 28-31, 89, 91 (August, 1951).

In a series of photomicrographs (several using shadowing techniques) a demonstration of the surface characteristics of coated and uncoated printing papers and their relationship to printing is presented. Examples cover newsprint, uncoated litho stock, sized and supercalendered coated stock, unbleached and bleached kraft stock, patent- and clay-coated board, and different types of coated papers, including machine- and cast-coated specimens, in some cases with letterpress, gravure, or offset printing. 16 photomicrographs. M.W.

DAY, FREDERICK T. Paper conversion and usage. No. 11. Standard requirements of box making materials. World's Paper Trade Rev. 135, no. 23: 1674-6 (June 7, 1951).

The requirements of satisfactory stay papers are discussed, including the kraft body, adhesive qualities, rigidity and pliability, creasing, quick setting of adhesives, weights, and storage hints. 2 illustrations. E.S.

MARCHAND, J., and RENARD, J. A study of the nicotine content in the smoke of cigarettes. Papeterie 73, no. 5: 263, 265, 267 (May, 1951). [In French]

Faldner (*cf.* B.I.P.C. 20: 105) claimed that in the case of noncombustible cigarette paper, as much as 50% nicotine (I) may pass in the smoke, whereas with combustible papers, this figure decreases to 25% and even less. The purpose of the present study was a re-examination of these figures, which seemed to be too high. In a fully described apparatus a series of studies was made using four different types of cigarette paper (two combustible and two noncombustible); in each case a charge of 1.2 g. of the same tobacco containing 11.4 mg. of (I) was used. The amount of (I) entering the smoke was determined accurately and shown to vary very little with the paper stock used, whereas the decisive factor was the porosity of the paper. The amount of (I) found in the smoke ranged from 2.14 to 2.41 mg. per cigarette consumed, i.e., from 18.8 to 21.1% of the total of (I) in the initial tobacco charge; noncombustible papers of identical porosity do not add more (I) to the smoke than the combustible types, and even with papers of low porosity, the difference is not large enough as to cause any concern. 1 figure, 2 tables, and 2 references. L.E.W.

MORRIS, CHARLES V. Today's market calls for applied paper 'know how.' Paper & Paper Products 92, no. 23: 1, 18-19 (Aug. 20, 1951).

Examples of successful substitutions for unobtainable printing-paper grades in critical rush situations are given. 2 tables. E.S.

WILLIAM S. SCULL COMPANY, *Camden, N.J.* Tea bags tagged in tandem operation. Packaging Parade 19, no. 223: 84-5 (August, 1951).

The packaging of tea in heat-sealing, thermoplastic-paper bags is described. Postwar consumer demand forced a return of tags to the tea bags, and tagging machines are linked in tandem with the bag-forming and filling machine. The tags are stapled to a string which has been stapled to the bag in a continuous process. 5 illustrations. M.W.

STITT, FRED, and TOMIMATSU, YOSHIO. Sensitized paper for estimation of mercury vapor. Anal. Chem. 23, no. 8: 1098-101 (August, 1951).

A sensitized paper was required for use with a portable instrument for the estimation of ethylene in air. A method has been developed for preparing sensitized paper, which is both uniform and reproducible (±5%) in its response to mercury vapor. Filter paper is impregnated with red selenium by soaking in potassium selenocyanate solution, draining, and exposing to a hydrogen chloride atmosphere. The quantity of reactive material per unit area of paper is easily controlled by adjusting the concentration of selenocyanate. The properties of this paper have been compared with those of selenium sulfide papers prepared by three different procedures, when used in the form of a strip over which a fixed volume of sample is slowly passed. A temperature of 65°C. or above was required for maximum reactivity of the mercury vapor with the reactive material on each of the sensitized papers. The length of blackening of selenium paper is directly proportional to the mercury vapor concentration and is insensitive to paper temperatures between 65 and 200°. Both selenium and selenium sulfide papers retained their original calibration after a year of storage at room temperature in the dark. 4 figures and 7 references. E.S.

PAPER SPECIFICATIONS

DELCROIX, PIERRE. What kind of paper is this? Papetier 5, no. 6: 73 (June, 1951). [In French]

When ordering paper "as per sample," certain specifications (such as furnish, ash, porosity, tear, burst, and degree of sizing) and essential use requirements should be listed in addition; many later complaints will thereby by avoided. E.S.

PATENTS

WEST, CLARENCE J. United States patents on papermaking, first quarter, 1951. Tappi 34, no. 8: 121-5A (August, 1951); *cf.* B.I.P.C. 21: 716.

A list of U. S. patents on papermaking for the first quarter of 1951 is presented. E.S.

PHOTOCHEMISTRY

SIPPEL, ARNULF. Chemical fibers and light. Melliand Textilber. 32, no. 3: 205-9 (March, 1951). [In German; English, French, and Spanish summaries]

A review of the literature is presented which deals with the photochemistry of (principally synthetic or regenerated) fibers. Special reference is made to the degradation of fibers exposed to daylight and artificial light sources, products which accelerate or retard the degradation, and methods for measuring the extent of damage. The references are scattered throughout the text. 1 table. E.S.

PHYSICAL TESTING—MOISTURE

LANDROCK, ARTHUR H., and PROCTOR, BERNARD E. A new graphical interpolation method for obtaining humidity equilibria

data, with special reference to its role in food packaging studies. Food Technol. 5, no. 8: 332-7 (August, 1951).

A method is described for determining equilibrium relative humidities of a wide variety of products rapidly and with simple equipment. All factors involved in the determination are held constant except relative humidity. Samples of a product of a certain moisture content are exposed to different relative humidities for an arbitrary constant time, usually one hour. Each sample is then weighed only once, in contrast to the usual methods whereby repeated weighings are made until weight equilibrium is reached. The gains and losses in weight per unit of time are plotted with reference to relative humidity. By interpolation, the equilibrium relative humidity is read at that point where the smooth curve drawn through the plotted data intersects the baseline representing no weight change. Repetition of this procedure with other samples of other moisture contents gives data for a humidity-moisture equilibrium curve covering a wide range of relative humidities and equilibrium moisture contents. Approximately two days are necessary to secure this curve. 5 figures and 9 references. E.S.

PHYSICAL TESTING—PAPER—BRIGHTNESS

DEARTH, LEONARD R., SHILLCOX, WAYNE M., and VAN DEN AKKER, J. A. Instrumentation studies. LXIV [incorrectly listed as LXVI] A study of photoelectric instruments for the measurement of color: Reflectance and transmittance. VIII [incorrectly listed as IX] The Densichron as a reflection meter. Tappi 34, no. 8: 126-32A (August, 1951); *cf.* B.I.P.C. 21: 865.

The Densichron is a new photoelectric instrument, designed primarily for densitometry, having such high sensitivity that it can be readily adapted to the measurement of reflectance. It is versatile in application. When equipped with a meter designed to give a linear relationship between the meter reading and the light intensity, the Densichron could be employed with any one of a variety of simple attachments which permit the measurement of reflectance. Such attachments could be relatively inexpensive because lenses and other optics (beyond filters) are not needed; another advantage lies in the fact that a very low-powered lamp will supply sufficient light for precise measurement. The model of Densichron used in this study (1949) suffers a linearity error which, although sufficiently small for the purposes of photographic densitometry, is much too large for the accurate measurement of reflectance. As might be expected, the effective wavelength of the instrumental response with a Wratten 49 filter is not the proper value for brightness determination, but it is shown to be possible to correct the effective wavelength through the use of a suitable corrective filter. When this is done and when corrections are made for nonlinearity, proper brightness values of paper are obtained. (This procedure is not recommended in the application of the Densichron to the mill control of brightness.) The method of specific calibration is described, and it is shown that, when used with this method, the Densichron correctly indicates the variability of brightness of paper, with a standard deviation essentially the same as that calculated from data on standard brightness. 6 tables, 2 figures, and 5 references. E.S.

PHYSICAL TESTING—PAPER—EXPANSION AND CONTRACTION

EMSCHERMANN, H. H., and KRUSE, J. The measurement of dimensional stability of paper with a mountable expansimeter. Das Papier 5, no. 13/14: 299-302 (July, 1951). [In German]

An instrument is described which was developed by M. Pfender for use in steel construction and which is now applied to the measurement of the dimensional stability of paper and board when subjected to varying moisture conditions. The conditioned paper samples are placed between two glass plates equipped with bore holes into which the stationary and the movable foot of the instrument fit. The expansion of the measured distance between the two feet is magnified by a lever transmission and recorded upon a dial. Details of the construction of the instrument, directions for sample taking and the measuring procedure, and the accuracy of the results in comparison with other methods are given. The instrument is made by F. Staeger, Berlin. 3 tables, 2 figures, and 3 footnotes. E.S.

PHYSICAL TESTING—PAPER—MACHINE DIRECTION

ANON. The A B C of paper and boards. Papetier 5, no. 8: 33, 35-6 (August, 1951). [In French]

The significance of certain paper properties is discussed, including bulk, thickness, the effect of fillers, and machine direction; several simple methods for determining machine and cross-machine directions are outlined. E.S.

PHYSICAL TESTING—PAPER—TEARING STRENGTH

FRANÇAIS, JEAN. A study of the tearing strength of paper. Bull. assoc. tech. ind. papetière 5, no. 5: 264-70 (July, 1951). [In French]

The tearing strength (I) of handsheets from six different types of pulp was determined by means of the Elmendorf tester (specified in the standard AFNOR procedure) (II), and by the use of the dynamometer (III) (*cf.* Micoud, Papier 33, no. 10: 1033-4, 1037-8, 1041-3 [October, 1930]). The large number of data [obtained with pulps from kraft, linters, and ramie (IV)] are given only in the case of (IV), uncarded, cut into various lengths, beaten in a Bouchet refiner to varying degrees S.-R., classified in a Lorentzen apparatus, and converted into handsheets, formed under pressures of approximately 40, 60, and 100 g./sq. m. Bursting strengths and breaking lengths of the various sheets from (IV) were also determined. The ratio (V) of (I) obtained with (II) to (I) determined with (III) usually ranged from 0.8 to 0.9, but the minimum (V) was 0.63, and the maximum was 1.44. Marked irregularities in (I) were noted when this was calculated on the basis of a sheet-forming pressure of 100 g./sq. m., on the assumption that (I) was actually proportional to the pressure under which the handsheet was made. Apparently there was no correlation between (I) calculated to 100 g./sq. m. and other variables, such as beating. The ratio (V) also showed marked irregularities, and the entire test presents difficulties which cannot be ascribed to any one factor. The author believes that an effective tear test should simulate as closely as possible a tear by hand, that only a single, unconditioned sheet should be used, and that only the initial tear should be measured. 7 tables and 2 figures. L.E.W.

PHYSICAL TESTING—PAPER—THICKNESS

GERMAIX, A. Beta-ray gages and their use in the manufacture of paper and thin laminated plastics. Bull. assoc. tech. ind. papetière 5, no. 5: 249-54; discussion 254-6 (July, 1951). [In French] *cf.* B.I.P.C. 21: 796.

This is the complete text and discussion of the article. 1 illustration. L.E.W.

PHYSICAL TESTING—PAPER—VAPOR TRANSMISSION

KREYENBUHL, A. Study on the permeability of paraffin paper. Bull. assoc. tech. ind. papetière 5, no. 5: 257-63; discussion: 263-4 (July, 1951). [In French]

A study was made of water-vapor permeability (I) of paraffined papers. The factors controlling (I) are temperature and R.H., paper quality, and the nature of the impregnating agent. Tests were carried out with 5 and 92% R.H., respectively, on each side of the test specimen, at 100°F. Tabulated data indicate the great variations in (I) with untreated paper on the one hand, and with paraffined papers from the same stock on the other. The influence of weight of material used in paraffining one sq. m. of paper, the effects on (I) of microcrystalline wax (II) *vs.* paraffin (III), and the marked effects of folding on (I) [depending largely on the plastic flow of (II) and (III) used] are also discussed. Although (II) is actually less effective than (III) in decreasing (I), papers treated with (II) when folded showed a smaller percentage decrease in (I) than did those treated with (III). The best results in (I) were obtained when two sheets were laminated together with (III). A treated paper is considered satisfactory when (I) is less than 15.5 g. of water/sq. m./24 hours, and which on folding shows a decrease in (I) of less than 30%. 8 tables and 5 figures. L.E.W.

PHYSICAL TESTING—PAPER—WET STRENGTH

ANON. An instrument for measuring the initial wet strength according to the construction developed in Darmstadt. Wochbl. Papierfabr, 79, no. 7: 181-2 (April 15, 1951). [In German] *cf.* B.I.P.C. 17: 574-5; 18: 254-5.

The construction and mode of operation of the instrument are described; it is manufactured by Firma Karl Frank, Weinheim-Birkenau. 1 illustration and 3 references. E.S.

PHYSICAL TESTING—PULP—SAMPLING

PADÉ, P. Testing consignments of pulp. I and II. Bull. assoc. tech. ind. papetière 5, no. 1: 36-48; no. 5: 286-96 (January, July, 1951). [In French]

The author describes the results of his moisture determinations carried out in the mill Cellulose de Strasbourg on a consignment of sulfite pulp sampled according to the three following methods: the diagonal method which is generally used in France, the wedge method which is the standard in Great Britain and Scandinavia, and the diagonal-axis method, which the author proposed and which is a compromise between the two other methods. The tests were carried out in two series, first on moist sulfite pulp with an average dry content of approximately 46.5%, and then on dry pulp with an average dry content of 84.3%. In the first case eight, and in the second, six bales were sampled. The tests are described in considerable detail, supplemented by diagrams and tabular data. In both series the wedge method gave the closest agreement, whereas the two other methods were about equivalent in accuracy. A third series of experiments with moist mechanical pulp is under way. General conclusions cannot be drawn until this series has been completed. 18 tables and 14 figures. E.S.

PHYSICAL TESTING—SCREW-CAP LINERS

PACKAGING INSTITUTE. *Drug and Pharmaceutical Committee.* New PI proposals. Modern Packaging 24, no. 12: 113-14, 172

(August, 1951); Packaging Parade 19, no. 223: 60 (August, 1951).

Two proposed test procedures which are concerned with the evaluation of liners for screw-cap closures are presented for trial and criticism. The purpose of PI Closures 1P-51 (Proposed) is to measure the barrier efficiency of screw-cap liners against water vapor transmission from a glass container. PI Closures 2P-51 (Proposed) deals with the determination of the suitability of a lining material in a screw-cap closure for use with a specific product in a glass container. 2 illustrations. M.W.

PLASTICS

BOYER, R. F. Effect of plasticizers on some physical properties of polymers. Tappi 34, no. 8: 357-62 (August, 1951).

The three major aspects of plasticizer behavior, compatibility, efficiency, and permanence, are discussed, and some theoretical relationships between these properties and the effects of temperature, molecular weight, viscosity, modulus of elasticity, rate of diffusion, and other physical constants are considered. 9 figures and 20 references. M.W.

JAHN, EDWIN C. Reciprocal paper-plastics developments. Tappi 34, no. 8: 8A, 10A, 12A (August, 1951).

Developments in methods of application of resins to paper, types of paper-plastics combinations (sized, wet-strength, grease- and moisture-resistant, laminated, and coated papers; flexible boards; laminated structural products; and pulp molding) and future trends are reviewed. 6 references. E.S.

PLASTICS—PAPER-BASE

UNITED STATES RUBBER CO. The glue is on the back. Modern Plastics 28, no. 12: 81-3 (August, 1951).

Satusply is a polyester decorative paper-base laminate which has a solvent-activated cement on its reverse side; it can be used for resurfacing sink tops, pantry ledges, bars and counters, etc. by nonprofessionals. Its production as a continuous laminate contributes to the ease of application with simple tools and hand pressure. In general it exhibits physical properties and characteristics similar to those of high-pressure laminates. The production process and method of application are described. 13 illustrations. M.W.

PLASTICS—TESTING

KLINE, GORDON M. Mechanical and permanence properties of laminates. Modern Plastics 28, no. 12: 113-14, 116, 118, 120, 122, 124, 182, 184, 186, 189 (August, 1951).

The results of investigations conducted by the National Bureau of Standards under the sponsorship of the National Advisory Committee for Aeronautics on the suitability of laminated plastics for various aircraft uses are summarized. The specific points investigated include: (1) mechanical properties of laminates at −70, 77, and 200°F., (2) effect of temperatures up to 700° on strength of laminates, (3) effect of laboratory and outdoor aging tests on laminates, and (4) effect of immersion in fuels on laminates. Two high-strength paper, phenolic-type laminates were among those tested. 12 tables and 11 figures. M.W.

POWER

MYERS, DAVID MOFFAT. Why by-product power is cheap power. Paper Ind. 33, no. 4: 416 (July, 1951); *cf.* B.I.P.C. 21: 798.

The reasons for the low price of by-product power and its cost in paper mills are discussed; the latter will vary with the capacity and load factor of a given paper-mill power plant, the cost of fuel and labor, the ratio of steam to power demand, and the excellence of design and operation. As fair targets for a plant of 30,000 kw., 2.3 mills, and for one of 3000 kw., 4.5 mills are listed. E.S.

PRINTING AND PRINTER'S INK

DAY, FREDERICK T. Paper conversion and usage. No. 10. Paper absorption and the printer. World's Paper Trade Rev. 135, no. 21: 1500, 1502 (May 24, 1951); *cf.* B.I.P.C. 21: 787.

With reference to the ability of paper to absorb and throw off moisture under varying humidity conditions, the importance of proper paper storage is emphasized. Mention is made of soft-sized papers for duplicating machines which provide the required, immediate ink absorption. China clay assists in counteracting the dimensional instability of lithographic printing paper in machine rooms where the humidity is constantly varying with temperatures and conditions of work, because it is not as readily influenced by such changes as the fibrous component of the paper. E.S.

ENGELHART, L. F. Printing ink and equipment development and their effect on paper requirements. Tappi 34, no. 8: 116-19A (August, 1951).

The author discusses satisfactory printability, the paper properties which govern it, ink structure in relation to drying, heat-set inks and moisture-set inks and their specific requirements of paper, and requirements for other quick-set inks. 3 references. E.S.

MORRIS, CHARLES V. A simple system for effective paper inventory control in printing plants. Paper & Paper Products 92, no. 22: 1, 14-15 (Aug. 5, 1951).

A system of perpetual paper-stock inventory and its advantages are outlined, with examples for modifications to suit individual requirements and special paper grades. 1 chart. E.S.

STANDARD PAPER BOX CORPORATION, *Los Angeles.* Pre-makeready slices downtime at Standard Paper Box. Boxboard Containers 69, no. 704: 6-8 (August, 1951).

The use of a pre-makeready system at Standard Paper Box Corp. has reduced downtime by 50%, and has proved so accurate in register that skeleton spot sheets have been held to an average of one per cylinder; for many runs no skeleton sheets are used. The factors responsible for the success of the procedure are: the patent base of lightweight magnesium, a registerscope, a proof press, a micrometer gage, and a plate-room team which consists of two girls who have been trained to change forms with precision and speed. Forms are made up from one hour to a full day ahead of press schedule, depending on the length of runs in progress. 5 illustrations. M.W.

WASS, W. H. Writhing fibres can wreck the job. Brit. Printer 64, no. 379: 20-3 (July-August, 1951).

The distortion of paper as a result of changing humidity conditions in the pressroom and in the press itself is discussed. Some suggestions for minimizing the variations in the size of paper include the purchase of preconditioned

paper which has a slightly higher moisture content than the standard R.H. at the press and the control of the R.H. of the atmosphere in which the paper is stored. 10 figures. M.W.

PRINTING AND PRINTER'S INK—ODOR TROUBLE

ANON. The problem of odour in package production. Indian Print & Paper 16, no. 67: 57 (April, 1951).

Residual odor in packages may be caused by adhesives, mold spores, or ink; the present article deals principally with the contribution which the ink may make to this problem. Letterpress or litho inks in which drying depends on the oxidation of an oil can produce offensive odors which come from acids and aldehydes produced during the drying process. Special ink formulations can be utilized to prevent this problem. Synthex heat-setting equipment will give dry prints right from the machine, and Drifast moisture-setting inks, which are based on synthetic resins and which dry by the action of moisture in the paper or board, can be made almost odorless and are suitable for use on packaging materials. Aniline inks and gravure inks which are based on alcohol as a solvent have the advantage of rapid drying and are especially useful for printing on foodstuff wrappings. M.W.

PULP DRYING

PERO, HEIKKI. Hot-air drying of pulp. Paper and Timber (Finland) 33, no. 7: 232-5 (July, 1951). [In Finnish; English summary]

In the drying of pulp, efforts are made to remove as much water as possible by mechanical means (such as pressing or suction), because of the low cost of this method. This can be carried as far as the condition of the water in the web and potential damages to the pulp permit. For additional water removal it is necessary to resort to heat as a drying medium. When drying cylinders (heat conduction) are used, the efficiency of the equipment can be improved by ventilation systems, particularly the installation of transverse air ducts. The best results are obtained with a completely enclosed drier. When hot-air drying is employed (heat convection or radiation), two stages must be considered in the removal of moisture: the movement of the water inside the web and the evaporation from the surface of the web. The first stage becomes critical when the surface reaches the saturation point of the fibers. At this point, the rate of drying decreases, and an increase in the surface temperature increases the risk of damage to the pulp. This fact should be taken into consideration in the construction of fan driers. These should be subdivided into several separate units or sections, so that the conditions will answer the requirements of each drying stage. No significant development has taken place in the application of vapor economizers after their use has become more widespread. The recovery of waste heat for the heating of water has found more general use, and the heating of the circulating water in particular will increase the efficiency of the machine. 3 figures. E.S.

PULP STONES

ANON. Finnish pulpstones. Finnish Paper and Timber 2, no. 5: 50-1 (June-July, 1951). [In English]

A brief reference is made to the manufacture of the Finnish artificial pulpstones marketed under the trade names Sampo and Kari-Ideal. 3 illustrations. E.S.

RADIOACTIVITY

GSON, R. The use of radioactive isotopes in the pulp and paper

industry. Paper and Timber (Finland) 33, no. 7: 246 (July, 1951). [In Swedish]

A brief review is presented. 2 figures and 14 references. E.S.

RAGS

KILPPER, WILHELM. A comparison of the suitability of cotton and linen rags and wood pulps. Das Papier 5, no. 10: 202-8; no. 11/12: 251-6; no. 13/14: 294-9 (May-July, 1951). [In German]

In attempting a comparison between rag (I) and wood pulps (II), the author emphasizes that "rags" is a collective term and that scant data are available on their chemical and physical properties. The term "rags" may include cotton linters, cotton or linen waste (clippings) which never reached a textile use, and cotton or linen rags proper which may have become more or less tenderized by subjection to rigorous washing procedures for a number of years. In using the term "rag halfstuff" it is therefore essential to specify the type and past history of the rags. In addition to morphological characteristics (the cotton and linen halfstuff fibers are longer and narrower than the short and rather wide coniferous fibers), the most general difference between (I) and (II) is that in the processing of (I), the reduction to pulp (apart from a mild chemical cook in the rag boiler) is accomplished principally by mechanical means, whereas in the case of (II), the disintegration is of a chemical nature, whereby the individual fiber is hardly subjected to a mechanical attack. The author has assembled extensive material on the chemical and physical properties of (I) (new and old cotton and linen rags and cotton linters) and (II) (sulfite and sulfate paper and dissolving pulps, the latter purified by different procedures) which is discussed in detail and presented in tabular and graphical form. Data are included on the development on beating of (I) and (II); fiber shortening during the beating process; strength of the resulting papers (breaking length, folding endurance, and tear-through); absorption height and parchmentizing properties; the relationship between absorption height and chemical parchmentizing properties; the relationship between absorption height and breaking length; density, air permeability, and porosity; and transparency, with a tabular summation of the specific characteristics of the different pulps. The data show clearly that (II) cannot be simply substituted for (I). The highly purified sulfite and sulfate pulps and some of the standard paper pulps equal *some* of the typical properties of (I); however, the typical combination of characteristics of (I) cannot be reached by any (II). On the other hand, when an exceptionally high breaking length is essential, (II) are superior to (I). The development of the highly purified alpha pulps from wood has made it possible to replace the free and highly absorptive cotton halfstuffs partially. However, it should be understood that even today (I), exclusively or at least in a certain percentage, cannot be dispensed with when use requirements place the highest demands on special pulps. This has been taught by experience, and it was partly the object of the present study to bring this factor to the fore. 4 tables and 17 graphs. E.S.

RAYON

PRESTON, J. M., and JOSHI, G. D. The morphology of regenerated fibers. Kolloid-Z. 122, no. 1: 6-8 (April, 1951). [In German] *cf.* B.I.P.C. 1, no. 11: 24 (July, 1931).

Three photomicrographs of cross sections of commercial viscose (I), acetate (II), and cuprammonium (III) rayons stained with Sky blue FF (British Colour Index 518) are presented to illustrate the difference in the

skin and core structure of these fibers. In both (I) and (II), the skin is dyed a deeper color than the core, whereas in (III) the opposite takes place; this is in agreement with the manufacturing processes and the mode of formation of the fibers. In (I) and (II) the denser, less readily swelling portions of the skin lie on the outside of the fiber and protect the core which is rendered less accessible to the staining liquid, whereas in (III) the denser portions of the core are surrounded by less dense and more readily penetrated outer layers. 3 photomicrographs and 30 references. E.S.

RAYON—ACETATE PROCESS

ENGELMANN, H. The significance of macromolecular chemistry for the cellulose acetate industry. Chem.-Ztg. 75, no. 11: 191-3 (April 15, 1951). [In German]

The author discusses the influence which the D.P. exerts upon the quality of the cellulose acetates and the strength properties of the resulting products (films, rayon, etc.). Acetates from wood pulps exhibit usually a higher viscosity of their concentrated acetone solutions than those from cotton linters; yet their D.P. is usually lower, as is the dry strength of the rayon fibers produced from beech- or sprucewood pulps. 3 tables, 2 figures, and 9 references. E.S.

RAYON—VISCOSE PROCESS

ENDRESS, FRIEDR. The application of processing techniques to the rayon industry. Chemie-Ingenieur-Technik 23, no. 11: 265-71 (June 14, 1951). [In German]

The author discusses the development of the rayon industry from purely empirical batch methods to a continuous process based upon scientific control. The fundamental procedures are outlined, and advances made in the individual stages are pointed out, with particular reference to their effect upon the economy of the entire process. 19 figures and 5 references. E.S.

GÄRTNER, FRED, and SAMUELSON, OLOF. Emulsion xanthation of cellulose. Part III. Svensk Kem. Tid. 63, no. 4: 114-20 (1951). [In English] *cf.* B.I.P.C. 21: 419-20.

The influence of the concentration of the washing lye and variation of the reaction volume on the xanthation residue and the degree of substitution (D.S.) of the residue was studied. A cold alkali-treated sulfite spruce pulp, a hot alkali-treated pulp, and cotton linters were emulsion xanthated, and the residues were washed in three different ways: (1) with sodium hydroxide of the same concentration as used in the emulsion xanthation, (2) with sodium hydroxide in a concentration of 60 g./l., and (3) with distilled water. Experimental difficulties with the third method prevented the completion of experiments with it. The D.S. is lower with method (1) than method (2) as a result of the greater dissolution with the former. When using method (2), the reproducibility of the undissolved residue is very good for all samples, which is not the case with method (1). It was found that there is no change in the nature of the dissolution curves for the pulps as a result of varying the sodium hydroxide concentration, and that variations in the carbon disulfide concentration did not greatly influence the amount of undissolved residue, except at high amounts in the case of the cold alkali-treated pulp and linters. Experiments concerning the effect of a variation in the reaction volume and shape of reaction vessels demonstrate the importance of standardizing these factors for obtaining reproducible results. 4 tables, 4 figures, and 4 references. M.W.

HERMANS, P. H. Investigation of the differential physical properties of rayons according to the method of Elöd. Kolloid-Z. 122, no. 1: 1-5 (April, 1951). [In German]

Elöd's method for the peeling of progressive layers of fibers (*cf.* Textile Research J. 18: 487-9 [1948]) was used to study the trends in physical properties of rayons from the outside toward the center of the fibers; the results were followed microscopically. In viscose fibers the peeling was continued until the last traces of the skin disappeared which were detectable by staining methods. An increase in density and a decrease in orientation from the outside toward the center of the fiber were noted. The degree of crystallinity (determined by x-ray methods) was not affected and remained uniform throughout. In one case the increase in density could be traced to a foamlike structure of the skin. Cuprammonium rayon, on the other hand, exhibited an increase of orientation from the outside toward the center. 2 tables, 7 figures, and 15 footnotes. E.S.

LAUER, K. The study of cellulose fibers. 14. The distribution of xanthate groups in heterogeneously xanthated celluloses. Makromol. Chem. 5, no. 3: 287-91 (February, 1951). [In German; English summary] *cf.* B.I.P.C. 21: 724.

Evidence is presented to show that the xanthation in the heterogeneous phase until α-values of 50 are reached leads to substitution in the 2-position of 50% of all glucose residues. Further heterogeneous xanthation until α-values of 75-80 are reached results in the substitution in the 3-position of the identical glucose residues as before, so that again 50% of all glucose residues have not reacted. 4 tables and 12 references. E.S.

LAUER, K. The study of cellulose fibers. 15. The conversion of cotton cellulose with sodium hydroxide. Kolloid-Z. 121, no. 1/2; 33-6 (February, 1951). [In German]

The measurement of the absorption of sodium hydroxide (I) by cotton linters and linters pretreated with different concentrations of (I) gave the following results: The absorption of 0.25 mole of (I) per glucose residue takes place from (I) solutions of concentrations up to 10%. With concentrations above 10%, the inner surface of the fiber is altered by the dissolution of the hydroxyl groups from the 2-positions of the crystalline zone. The remaining mercerized cellulose possesses 0.75 mole of hydroxyl groups, of which 0.5 mole is in the 2-position and may form a compound with (I), and 0.25 mole is in the 3-position and may be xanthated after the hydroxyl groups in the 2-position have reacted. These results are claimed to explain the compound formation of cellulose with (I) as an intermediate stage of xanthation; they also show why mercerized celluloses can give soluble xanthates with 10% (I) and make the existence of alkali cellulose I improbable. 2 tables, 1 figure, and 16 references. E.S.

LAUER, K. The study of cellulose fibers. 16. The study of the structure of the cotton fiber. Kolloid-Z. 121, no. 1/2: 36-9 (February, 1951). [In German]

The author postulates that water does not penetrate the crystalline zone of the native fiber, so that for hydrate formation the necessary hydroxyl groups must be present in the amorphous fraction; the surface of the cellulose crystal is assumed to contain molecules or parts of molecules which possess no free hydroxyl groups. From chemical and physical data it is concluded that about two hydroxyl groups each are available for reaction

with water in the glucose residues of the amorphous regions. The cotton fiber contains only two fractions, crystalline and amorphous cellulose; as soon as cellulose hydrate crystals are formed, either by mercerization or a spinning process, the fiber possesses three regions: a crystalline zone, a semicrystalline layer which contains the reactive hydroxyl groups, and an amorphous zone. 2 tables and 25 references. E.S.

LAUER, K. The study of cellulose fibers. 17. The density of cellulose fibers. Kolloid-Z. 121, no. 3: 135-7 (March, 1951). [In German]

On the basis of the schematic structure of cellulose fibers (composed of crystalline and amorphous fractions) developed in Part 16 of this series, the densities of the fractions in water were calculated and the existence of three hydrates was established: hydrate I, $C_6H_{10}O_5 \cdot 0.33\ H_2O$, density 1618 (surface hydrate of cellulose II crystals); hydrate II, $C_6H_{10}O_5 \cdot 1.5\ H_2O$, density 1642 (obtained from mercerized ramie by Hermans, with one mole of water present as hydrate III and 0.5 mole present as hydrate I); and hydrate III, $C_6H_{10}O_5 \cdot 2\ H_2O$, density 1664 (with all glucose residues of the amorphous zones completely hydrated). 1 table and 12 footnotes. E.S.

LAUER, K. The study of cellulose fibers. 18. The heats of reaction in the formation of the cellulose hydrates I and III. Kolloid-Z. 121, no. 3: 137-40 (March, 1951). [In German]

With reference to the fibrous structure of native and mercerized cotton established in previous articles of this series, the heats of reaction during the formation of the cellulose hydrates on the hydroxyl groups of the identical glucose residues in the 2- and 3-positions were calculated as follows: hydrate on the 2-position, 3624 kg.-cal. per mole of water, and hydrate on the 3-position, 3168 kg.-cal. per mole of water. On the basis of these data, the heats of reaction in the treatment of cotton or mercerized cotton with sodium hydroxide of different concentrations were calculated as follows: for the absorption of sodium hydroxide by cotton, 6737 kg.-cal. per mole of sodium hydroxide; for the mercerization of cotton, 1108 kg.-cal. per mole of hydrate; and for the conversion of cellulose I to cellulose II, 1477 kg.-cal. per mole of crystal. 4 tables, 1 figure, and 6 references. E.S.

RAUCH, H. The dissolution of native or regenerated cellulose fibers with reference to the rayon and staple-fiber industry. Melliand Textilber. 32, no. 4: 283-9 (April, 1951). [In German; English, French, and Spanish summaries]

Following a brief discussion of the swelling (ballooning) and dissolution mechanism of native cellulose fibers, the author discusses the occurrence of resistant, suspended particles (I) in the different solutions, particularly in viscose. The percentage and shape of (I) differ from fiber to fiber, as illustrated in photomicrographs of (I) isolated from straw, beech, spruce, and pine pulps. The author determined that (I) consist of a cellulosic substance with very low reactivity, which presumably originates in the epidermis or in the fine membranes which hold the structural elements of the native fibers together; they are in no way connected with resinous residues. It is impossible to remove them either by centrifugation or filtration under pressure from the spinning solution, where they cause plugging of the spinnerets. Their quantity is in direct relationship to the processing of the cellulose. Pulps which prior to xanthation had been exposed to a prolonged drying procedure at 70-90°C. or to repeated short drying cycles at exceptionally high temperatures (100-180°) give far more (I) than those which were

dissolved immediately without an intermediate drying step; highly concentrated solutions or those prepared from highly degraded celluloses also show a large percentage of (I). Solutions prepared from cellulose with a high D.P. give less (I) than those made from pulps with a low D.P. Overbleached or very slow-beaten pulps or excessively aged alkali celluloses also yield considerable quantities of (I) in the viscose solutions prepared from them. In conclusion, reference is made to hitherto unpublished work in which the dissolution of native and regenerated cellulose fibers was studied in different solvents, with particular reference to the occurrence of (I). All native fibers were found to dissolve under certain conditions in two stages (swelling with ballooning and dissolution proper), irrespective of the solvent. All regenerated celluloses swell uniformly and dissolve directly in the same solvents, whereby those with a skin go into solution at a slower rate than the skinless types (Lanusa fibers); (I) are again present in all cases. The primary swelling stage is partly or entirely suppressed when the solution takes place after a preceding mechanical, chemical, or thermal action on the native fibers; however, the solutions still contain (I). 20 figures and 11 footnotes. E.S.

SCHWERTASSEK, K. Studies of viscose fibers and the viscose process by means of the iodine sorption. Third communication concerning the relationship of iodine sorption and the state of crystallization of cellulose fibers. Melliand Textilber. 32, no. 6: 460-5 (June, 1951). [In German; English, French, and Spanish summaries] *cf.* B.I.P.C. 21: 343.

The individual stages of the viscose process are discussed with regard to the influence of the state of crystallization during these stages on the finished fibers, as indicated by the iodine sorption (I). As mentioned in the previous articles of this series, (I) may be considered a measure of the amorphous fraction of cellulose; a decrease of (I) indicates an increase in crystallization. The type of pulp and the aging conditions of the alkali cellulose (degree of degradation during aging) have an appreciable influence on the ability of cellulose to crystallize (II). A relationship was found to exist between the D.P. and (II); a lower D.P. results in a lower (II), as indicated by a higher (I). The ripening of viscose, the concentration of the spinning bath, and the type of finishing treatment do not affect either (I) or (II), whereas the methods of drying and storing after coagulation of the fibers are decisive factors. Damp, warm storage conditions, preferably at higher temperatures (provided that drying out is prevented) promote the crystallization of the fibers. 16 tables, 6 x-ray photographs, and 2 references. E.S.

RESEARCH

CAMPBELL, W. BOYD. Some things we don't know. Pulp Paper Mag. Can. 52, no. 8: 75-8 (July, 1951).

The need for basic knowledge and fundamental research in the pulp and paper industry is illustrated by examples. E.S.

LURIE, A. G. Budgeting for the research and development department. Tappi 34, no. 8: 40A, 42A, 44A (August, 1951).

The budgeting control principles used in effective management of the manufacture and sale of products can also be used in controlling the expenditures for research and development. The author discusses the establishment of a research budget by classes of expenditures and the budgeting for each project that will be undertaken during the period; periodic revision of the budgets is recommended. The procedure is only of value if expenditures

made are properly recorded in accordance with the budget, so that comparisons can be made between the amounts actually expended and those authorized. Records should be maintained and monthly or quarterly reports prepared so that those responsible for the functions of the department can control their expenditures in line with the budget. 2 tables. E.S.

SALESMEN AND SALESMANSHIP

ANON. Sell the photo engravers. Paper & Twine J. 25, no. 5: 10-11 (July, 1951).

Photo engravers provide a market for many types of paper, e.g., coated and enameled stock, tissue paper, fileproof paper, glassine, blotting paper, tympan paper, and make-ready stock, in addition to wrapping paper and packing supplies. The consideration of paper salesmen is directed to this potential new outlet. M.W.

SEMI-CHEMICAL PULPING PROCESS

AGRONIN, TANY. Development of a system for neutral sulphite pulping. Tappi 34, no. 8: 102-5A (August, 1951); Paper Trade J. 133, no. 5: 28, 30 (Aug. 3, 1951).

A method for the treatment of pulp after digestion is presented in which a number of machines are employed, each of which is adapted to handle efficiently a specific part of the pulping and refining cycle. The stock from the digestion system flows into a Shartle Drubber, which is a series of Hydrapulper rotors which operate at high speed in an enclosed casing and which break down the chips so that they can be handled by subsequent Hydrafiners and Hydramills. The system is designed especially to provide suitable pulp for board, but may be modified for use with bleached hardwood pulps. Among the advantages attributed to the system are automatic controls, low over-all power requirements, and low over-all cost. 4 figures. M.W.

CHEMICAL WEEK. Semi-chemical gains. Chem. Week 69, no. 8: 9-10 (Aug. 25, 1951).

Eleven expansion projects now underway will increase the daily output of semichemical pulp from its present 2500 tons to 3500 tons. This amounts to a fourfold increase over a five-year period, and if expansion continues at this rate, it will soon equal or surpass groundwood production. This trend is the result of more economies provided by the process through higher yields and utilization of hardwood species. Mention is made of some of the paper companies in this country and Canada which are employing the semichemical process. 1 figure. M.W.

JONES, R. M., and DETCHER, T. E. Ammonia base in the neutral sulphite semichemical pulping process. Tappi 34, no. 8: 88A, 90A, 92A (August, 1951).

The use of ammonium *vs.* sodium sulfite is discussed, and it is shown that the two are interchangeable as far as yield and quality of pulp are concerned. The ammonia-cooked pulp has a darker color in the unbleached state, but no more bleach is required to obtain the same brightness than is required for the sodium cook. The operating experience of two mills, one producing board-type pulp and the other paper-type pulp, is described; the process must still be regarded as being in the development stage. The present report should be considered as a progress report. 1 table, 3 figures, and 5 references. E.S.

SETUP BOXES

"ESTEVAN." Rigid wire-stitched boxes. Paper Box Bag Maker: 287-8 (June, 1951).

The author explains a method of creasing, slotting, and wire-stitching a sample box of the ordinary loose-lid, rigid type. 1 illustration. M.W.

FRA. Calculations for cardboard boxes. (VIII). Allg. Papier-Rundschau no. 11: 467-9 (June 12, 1951). [In German] *cf.* B.I.P.C. 21:727.

A sample calculation is given of the cost (in Germany) of a luxury package for a perfume bottle, consisting of an upright, velour paper-covered, rectangular box with telescoping lid and gilt edging; the bottom part consists of three tiers, and the smallest top section forms a receptacle to fit tightly around the perfume bottle. 2 tables and 1 illustration. E.S.

SHIPPING CONTAINERS—TESTING

LANDROCK, ARTHUR H., and PROCTOR, BERNARD E. Free oil in packaged foods. Modern Packaging 24, no. 12: 107-12 (August, 1951).

A quantitative test for the measurement of the free-oil content of foods is outlined. The oil or fat absorbed from a food product by a standard absorptive box is extracted with petroleum ether after the stain pattern is recorded. Standard conditions of temperature and relative humidity are maintained. The results are expressed in terms of mg. of free fat/g. of food product. Data are presented for 18 different food products. It was found that the fat absorbed was about twice as much at high (90%) as at low relative humidities (0-30%). 3 tables, 6 figures, and 16 references. M.W.

SLIME PREVENTION

APPLING, JOHN W., RIDENOUR, N. JEAN, and BUCKMAN, STANLEY J. Pink slime in paper mills; control and identification of certain causative organisms. Tappi 34, no. 8: 347-52 (August, 1951).

Pink slime is of unusual importance in some paper mills because it is a difficult slime to eliminate and also because it produces undesirable pink spots in white paper. The authors have studied a group of seven pink slimes which originated in six Fourdrinier paper-machine systems and in one top white-liner vat system of a cylinder machine. The objective of this study was twofold: first, to isolate and identify the pigment-producing organisms in pink slimes, and second, to learn how to control these more efficiently. Thus far, the authors have isolated the pigment-producing species of organisms from three pink slimes which came from three Fourdrinier systems. Three species of bacteria were found repeatedly in these slimes and they have been identified as: *Alcaligenes viscosus, Bacillus subtilis,* and *Flavobacterium marinum.* The last-named species belongs to a genus which is characterized, in part, by yellow colonies. A surprising discovery, however, was that all isolates resembling either *A. viscosus* or *B. subtilis* readily produced pink pigment when grown on a potato-infusion agar at a pH of 6.1. To study the control of these pigment-producing bacteria, percentage kills were determined in a pulp substrate. The results of these tests and other work suggest that neither individual cells nor small aggregates of these organisms offer any unusual resistance to commonly employed slime control agents. Thus, the effective control of such organisms must be directed at

thick films and relatively large masses. Thorough cleaning of the mill system by washing and scraping accessible surfaces followed by spraying them with BSM-11 or Butrol has been found effective. When the infection is present in locations which are not readily accessible, the circulation of a hot toxicant-detergent solution throughout the system for several hours has been found preferable, particularly when followed by the spraying of accessible surfaces. A recommended procedure for the preliminary evaluation of different toxicants for slime control is described in an appendix. 2 tables and 10 references. E.S.

SODIUM XYLENESULFONATE

Dereser, R. The useof sodium xylenesulfonate as a hydrotropic compound in the chemical industry. Angew. Chem. 63, no. 14: 327-8 (July 21, 1951). [In German]

In a review of industrial applications of hydrotropic solutions in the United States, reference is made to McKee's studies with sodium xylenesulfonate as a cooking agent for wood, bagasse, bamboo, straw, and the like (*cf.* B.I.P.C. 17: 283). 19 references. E.S.

STATIC ELECTRICITY IN PAPER

WALKUP, LEWIS E. Static electricity in printing. Printing Equip. Engr. 81, no. 11: 46-7, 88, 90 (August, 1951); Graphic Arts Monthly 23, no. 7: 65-6, 132 (July, 1951).

Following a brief review of the nature and effects of static electricity, the problem it creates in the handling and printing of paper is discussed. It is pointed out that the most effective method for the elimination of static charges from paper involves an increase in the conductivity of the paper itself through an increase in its moisture content. Paper can be made reasonably conductive by storage and use at an R.H. above 40%. Other methods of static elimination result from the ionization of the surrounding air through the use of radioactivity or the alteration of an electric field by metal points or wires. M.W.

STATISTICAL METHODS

BICKING, CHARLES A., and TRELFA, RICHARD T. Case studies in the application of industrial statistics to papermaking. Tappi 34, no. 8: 370-80 (August, 1951).

Five case studies of actual applications of industrial statistics to papermaking which describe control activities at a very practical level are included. The first explains how control charts were used to reduce variation in basis weight across the paper web as well as in the machine direction of the paper sheet. The second covers the use of frequency distributions to analyze and portray changes in basis weight and headbox freeness. The third case study describes the use of significance tests to measure and improve the precision and accuracy of two analysts using greaseproof test data. The fourth uses control charts to demonstrate how the number of errors made by paper sorters was drastically reduced. The final case study employs the analysis of variance technique to investigate paper-testing techniques with the purpose of improving critical factors in the water penetration test. Four testers and eight different papers were involved. Each study includes presentation of all the original data, description of the method of statistical analysis, and careful summarization of the interpretation, action taken, and results. An appendix is included which shows all the computations involved in each study. 8 tables, 4 figures, and 8 references. E.S.

STRAINS AND STRESSES

ANDERSSON, OLLE, and BERKYTO, EDWARD. Some factors affecting the stress-strain characteristics of paper. Part 1. Influence of temperature. Part 2. Influence of relative humidity. Svensk Papperstidn. 54, no. 13: 437-44 (July 15, 1951). [In English; German and Swedish summaries]

(1). The influence of temperature on the stress-strain characteristics of paper has been studied for a temperature range of −50 to +150°C. The slope of the stress-strain curves and the tensile strength have both been found to decrease with temperature. Since a sound, purely theoretical basis for the interpretation of the results was lacking, a purely empirical interpretation was made. Various equations were fitted to the data by the method of the least mean square, and the goodness of fit was measured by calculating a correlation coefficient. The linear relationship was found to be most suitable for the effect of temperature, and equations of the following form were fitted to all data: $\sigma = (A\varepsilon + B\varepsilon^2) + (C\varepsilon + D\varepsilon^2)t$, where σ is the stress (in kg.), ε is the strain (% elongation), t is the temperature (in °C.), and A, B, C, and D are constants. In a similar manner, linear equations were fitted to the breaking stress- and breaking elongation-temperature data. Further mathematical derivations can be obtained from these equations, for instance, a Young's modulus-temperature relationship. 3 tables, 2 figures, and 8 references. (2). The stress-strain characteristics of a newsprint and a machine-glazed kraft paper were examined over the entire humidity range. Sorption isotherms were determined for the two papers which permitted the comparison of the data as a function of water content. The results showed a rapid change of the shape of the curves at humidities between 60 and 80%. In contrast to earlier reported work, no maximum was found in the tensile strength at an intermediate R.H. The elongation curves in the cross-machine direction increased rapidly with R.H., but showed a tendency to level off at high humidity values. In the machine direction an actual reversal of the upward trend was observed at approximately 80% R.H. The initial slope of the stress-strain curve closely followed the trends observed for breaking stress. The curves for area under the stress-strain curves were less well-defined, but did show a maximum, probably near 60% R.H. The plotting of the data as a function of the water content of the sample indicated that, near and above the saturation point, the influence of water is not as marked as at lower moisture contents. 3 tables, 10 figures, and 8 references. E.S.

STREAM POLLUTION

SPENCER, HORACE A. A few thoughts on stream pollution. Tappi 34, no. 8: 113-15A (August, 1951).

Stream pollution laws in New York State are discussed, and means are suggested for aiding the pulp and paper industry in the problems involved. E.S.

SUGARS

MCFARREN, EARL F., BRAND, KATHLEEN, and RUTKOWSKI, HENRY R. Quantitative determination of sugars on filter paper chromatograms by direct photometry. Anal. Chem. 23, no. 8: 1146-9 (August, 1951).

A method is presented in which direct photometry is employed to achieve a quantitative determination of galactose and glucose on a paper chromatogram. In this method the maximum densities of the developed sugar spots are determined by means of a densitometer, and a standard curve is prepared

by plotting the logarithm of the concentration against the densities. The concentration of unknowns is calculated from the standard curve with an error no greater than 5%. 2 tables, 2 figures, and 11 references. M.W.

SULFATE MILLS

CANADIAN PULP AND PAPER INDUSTRY. First details of Harmac expansion. Can. Pulp Paper Ind. 4, no. 8: 26, 29 (August, 1951); *cf.* B.I.P.C. 21: 46.

Included in the expansion program at the bleached sulfate mill of the H. R. MacMillan Export Co., on Vancouver Island are: eight new digesters, a 250-foot warehouse addition for pulp and general storage, a $500,000 deep-sea dock, a $2 million rock-fill dam, tunnel and pipeline, an enlarged screen room and bleaching section, a new recausticizing system, two recovery boilers and three VU boilers, a blowtank, and a new system of pneumatic chip handling. Completion date for the expansion, depending on availability of materials, is set for the late summer of 1953. 2 illustrations. M.W.

SULFITE MILLS

PAPER INDUSTRY. Columbia Cellulose dedicates new sulphite mill at Prince Rupert. Paper Ind. 33, no. 5: 508-17 (August, 1951); *cf.* B.I.P.C. 21: 805-6.

A detailed description of the new dissolving pulp mill of Columbia Cellulose Co., a subsidiary of Celanese Corp. of America, is given. 1 flowsheet and 28 illustrations of the installations. E.S.

SULFITE PROCESS

ADLER, ERICH. Sulfite pulping properties of spruce wood from unpeeled, floated logs. Part 1. Catechol tannins in the surface layer of the sapwood. Svensk Papperstidn. 54, no. 13: 445-50 (July 15, 1951). [In English; German and Swedish summaries]

In Sweden a considerable amount of sprucewood for sulfite pulping is floated to the mills in unbarked condition. The surface layer of such floated wood, about 5 mm. in thickness, is resistant to sulfite cooking and gives an abnormally high percentage of screenings. According to Sundstedt (*cf.* B.I.P.C. 6: 157; 7: 322) this layer gives a violet color reaction when moistened with a solution of one part of concentrated sulfuric acid in four parts of methanol. Sundstedt's color reaction was investigated for the purpose of obtaining a better insight into the specific constituents of this surface layer. It was found that the reaction is caused by catechol tannins (flavotannins) which migrate from the bark into the sapwood during floating or water storage. The color reaction is analogous to the lignin-phloroglucinol reaction and is due to the condensation of the coniferyl aldehyde groups of the lignin with the polyphenolic catechol tannin. In extracts from the wood layer under consideration or from bark, the catechol tannins can be detected by adding coniferyl aldehyde or its methyl ether and a mineral acid. Similar violet color reactions were obtained with pure *d*-catechin as well as commercial catechol tannins. A solution of coniferyl aldehyde or its methyl ether in alcoholic mineral acids has been found to be a sensitive reagent for catechol tannins. Neither the hydrolyzable tannins and their phenolic constituents (such as gallic acid), nor flavones or flavanones react with coniferyl aldehyde. The purple color reaction given by many wood species with a solution of hydrochloric acid in methanol (*cf.* Isenberg and Buchanan, B.I.P.C. 16: 270), as well as Höhnel's xylophilin reaction are also caused by the presence of catechol tannins. Their detection in the

surface layer of floated, unbarked spruce logs supports the view previously expressed by Erdtman (*cf.* B.I.P.C. 11: 142) that the resistance of such wood to sulfite pulping may be due to a lignin-phenol condensation. 1 figure and 17 references. E.S.

ADLER, ERICH, and STOCKMAN, LENNART. Sulfite pulping properties of spruce wood from unpeeled, floated logs. Part II. Sulfite cooking experiments. Svensk Papperstidn. 54, no. 14: 477-82 (July 31, 1951). [In English; German and Swedish summaries]

The possibilities were studied for obtaining improved cooking results with the surface wood from floated, unbarked spruce logs. Different samples of such wood yielded from 13 to 36% screenings on sulfite cooking. Cooking with a sodium bisulfite solution followed by a standard calcium-base digestion resulted in a considerably improved reduction to pulp. Similar results were obtained with a calcium-base liquor alone, when a high base content and a prolonged preheating period at low temperature were employed. On treatment of the wood chips with sodium hydroxide solutions at room temperature, some of the phenolic substances were extracted; however, a subsequent sulfite cook was not successful. An attempt was made to block the reactive positions of the phenolic substances in the wood prior to the sulfite cook. The pretreatment of the wood chips at room temperature or 80°C. with formaldehyde in alkaline solution, or with formaldehyde in the absence of alkali at 80°, or with a formaldehyde-sodium sulfite mixture at 80° resulted in considerably improved reductions to pulp. A similar effect was observed in the case of pine heartwood. 6 tables and 15 references. E.S.

HÄGGLUND, E., and LANGE, P. W. Sulfite cooking of beechwood attacked by white rot. Makromol. Chem. 6, Staudinger Festband: 280-91 (March, 1951). [In German; English summary]

Sulfite cooks were carried out with decayed beechwood which had been attacked by *Polyporus igniarius*. It was found that in the digested wood the boundary regions between the lumen and the inner wall of the secondary lamella became coated with a substance which absorbed ultraviolet rays and which was caused by the fungus. This substance (I) was not further investigated, but is considered to be possibly of tannin character. In some cases the lumen became completely filled with solid (I). The assumption is made that (I) condenses the dissolved lignin, thereby blocking the circulation and penetration of the cooking liquor. These factors contribute to abnormal cooking conditions and cause a greater degradation of the cellulose component of the fiber than normal cooking conditions with sound wood. If the beechwood includes a certain percentage of infected sections, the digestion will be nonuniform, and the resulting paper and dissolving pulps will be much darker in color and of inferior quality. 5 tables, 10 figures, and 9 references. E.S.

HOWARD, E. J. Sulphur reactions in sulphite cooking. Part II: Some physicochemical aspects. Pulp Paper Mag. Can. 52, no. 8: 91-7 (July, 1951); *cf.* abstract below.

Penetration of sprucewood by cooking acid depends on the degree to which the bordered pits of the tracheids are open; the closure of these by pitch, silt, etc., leads to defective pulping. Interaction between lignin and acid starts in the regions surrounding the pits. A large and variable amount of air remains inside the chips at the commencement of cooking. The air is located mostly in the spring fiber and disappears only toward the end of cooking. Theoretical calculations indicate that sufficient air is present inside a chip to give rise locally to a high hydrogen concentration (pH 1.0-1.6) as a

result of the oxidation of sulfur dioxide to sulfur trioxide. Unless neutralized by base ions, the H-ions hydrolyze the lignin and condense it to products which give rise to "burnt" centers or screenings. There is no sharp demarcation between lignin and cellulose in sprucewood fiber. This is also true for the cooked fibers. Diffusion of cooking liquor through the cell wall proceeds from the middle lamella toward the lumen. Lignin plays a protective role in sulfite cooking. Any mechanical action on the fibers either before or during cooking which tends to remove the lignin and expose the cellulose causes a hydrolytic breakdown of the latter. The consequences are lower pulp yield and poorer quality. Three-quarter inch chips give maximum packing, yield, and strength; they should have minimum crushing and bruising. Sawdust contributes the most screenings and thereby uselessly consumes sulfur. Wood has a large capacity for combining with sulfur dioxide in gaseous or liquid form. High sulfur consumption in cooking may be related to oversulfonation of wood. Careful presteaming of the chips followed by acid impregnation under pressure leads to the following improvements in cooking: (*a*) Penetration is greatly accelerated by the removal of air and the unsealing of the heartwood tracheids; the cooking cycle can be shortened. (*b*) Screenings are lowered, and a corresponding increase in pulp yield is obtained. (*c*) Woods of uneven moisture content can be cooked together. (*d*) Refractory woods (e.g., pines) can be cooked with a fair degree of success. (*e*) Some sulfur economy is possible as a result of (*i*) the elimination of the oxidative effect of air in chips, (*ii*) increased pulp yield, and (*iii*) use of lower combined sulfur dioxide. Two-stage cooking avoids the combination of sulfur dioxide with the sugars released in the second half of normal cooking. This is accomplished by draining the cooking liquor halfway through the cook (or whenever sulfonation is complete), replacing the liquor with hot water, and continuing the cook at 160-170°C. The drained cooking liquor is used to make up fresh acid. In addition to sulfur savings, improved pulp yields appear possible. 13 figures and 9 references. E.S.

McKEE, W. F. Changes in equipment and in operating practices which will reduce sulphur consumption. Pulp Paper Mag. Can. 52, no. 8: 79-82 (July, 1951); *cf.* B.I.P.C. 21: 733.

A summary of the report presented by the Sulphite Committee of the Technical Section, Canadian Pulp and Paper Association as a result of a survey of the operating practices of 10 sulfite mills is given. Methods of sulfur conservation which were suggested by the investigation are discussed under the following headings: maximum gas recovery through pressure reduction before blowing, maximum recovery of acid by means of side relief, changes in cooking practices, acid-plant operation, and increased yield of pulp from wood. M.W.

RAPSON, W. H., and WAYMAN, M. Sulphur reactions in sulphite cooking. Part I. Fundamental chemical considerations. Pulp Paper Mag. Can. 52, no. 8: 88-90 (July, 1951).

The chemical reactions in sulfite pulping in which sulfur takes part are reviewed. The two main reactions are sulfonation, and hydrolysis catalyzed by acids. The timing or sequence and extent of these two reactions determines the success of the cook. In competition with the sulfonation reaction, lignin heated to high temperatures at low pH condenses to products of high molecular weight. These will not sulfonate further, and therefore any such lignin is not dissolved during sulfite cooking. The reaction of sulfurous acid with sugars forms aldonic acids and thiosulfate. Aldehydes react with sulfur dioxide to form "loosely combined sulfur dioxide." From published analyses of lignosulfonic acids, and from what is known of the nature of the other sulfur-containing compounds formed in sulfite cooking, it is calculated that

the production of one ton (airdry) of rayon sulfite pulp (42% yield) should consume about 175 pounds of sulfur during cooking, whereas paper pulp (46% yield) should consume about 160 pounds of sulfur per ton. Such sulfur is not readily recoverable as sulfur dioxide. In conclusion, a method for determining total sulfur in spent sulfite liquor is described which is based on the use of nitric and perchloric acids. 7 references. E.S.

SULFITE PROCESS—AMMONIA BASE

JONES, R. M., and DETCHER, T. E. Ammonium bisulphite pulping. Paper Trade J. 133, no. 5: 20, 22, 24, 26, 28 (Aug. 3, 1951); Paper Mill News 74, no. 36: 12-16 (Sept. 8, 1951).

The authors present a report on the progress in the development of ammonium bisulfite pulping on a commercial scale. The advantages and limitations of the process which have been revealed in operating experience are described and contrasted with those of calcium-base pulping. Because of such favorable aspects as more extensive and efficient wood utilization, less initial equipment cost, and advantages with respect to the disposal of spent liquor, it is predicted that the ammonia-base process will take a leading position in the manufacture of sulfite pulp. 2 tables. M.W.

SULFUR

BUISSON, ARTHUR. The sulphur industry in Canada. Pulp Paper Mag. Can. 52, no. 8: 62-6 (July, 1951).

In this review of the Canadian sulfur industry, data on production consumption and trade of sulfur are included, and descriptions of research and industrial projects for recovering sulfur from natural gas, smelter gases, pyrrhotite, pyrites, and bituminous sands, and for producing liquid sulfur dioxide are presented. 2 tables and 6 references. M.W.

CANADIAN PULP AND PAPER INDUSTRY. How elemental sulphur will be produced at Jumping Pound. Can. Pulp Paper Ind. 4, no. 8: 6-9 (August, 1951).

The operation of the Jumping Pound, Alta. sulfur plant of the Shell Oil Company of Canada is described. It is designed to recover 30 long tons of sulfur per day from waste acid gases which are produced by the gas-treating plant, where acidic contaminants (hydrogen sulfide and carbon dioxide) are removed from approximately 30 million cu. ft./day of natural gas. 4 figures. M.W.

FERRALYST DESULPHURIZING CORPORATION, *New York*. Sulfur separator. Chem. Week 69, no. 8: 24 (Aug. 25, 1951).

A new catalytic method, originated in Australia, for the recovery of sulfur from gases is now under investigation in this country. In the process all organic and inorganic compounds of sulfur in the gas are oxidized to elemental sulfur or to sulfur dioxide in a single pass over the catalyst, which is a mixture of active iron sulfides, sodium sulfide, and sodium sulfite, deposited on a carrier such as kieselguhr. The catalyst has little effect on the constituents of the gases or vapors but has a selective action on all sulfides; it does not foul chemically under normal circumstances. The performance of the process is good over a wide variety of conditions. M.W.

PRIESTLEY, J. J. British sulphur. Ind. Chemist 27, no. 318: 305-8 (July, 1951).

Possible domestic sources of sulfur, sulfur requirements, and the various

processes available for increasing sulfur supplies in England are discussed. 2 figures and 14 references. M.W.

SULFUR DIOXIDE

JULL, N. A., and MARSTON, W. T. Sulphur dioxide from sulphides by FluoSolids. Pulp Paper Mag. Can. 52, no. 8: 83-7 (July, 1951); *cf.* B.I.P.C. 21: 870.

A description of the FluoSolids process is presented, and the handling of solids, gas production and handling, and instrumentation are discussed. 1 table, 3 figures, and 2 references. M.W.

SUNFLOWER STALKS

FACHMANN. Straw pulp as paper halfstuff. Wochbl. Papierfabr. 79, no. 7: 183-4 (April 15, 1951). [In German]

The suitability of sunflower stalks (*Helianthus annuus*) for the manufacture of paper and dissolving pulps is emphasized; large-scale plantations in suitable climates (Italy, Yugoslavia, southern France, Portugal, North Africa) are considered preferable to poplar culture and the use of tropical woods, because they serve the double purpose of supplying foodstuffs and a fibrous raw material. The chief obstacle, the harvesting and transportation of the stalks, has been solved through the introduction of heavy baling presses which permit the delivery of all kinds of annual plants in bales, similar to straw bales. E.S.

SYNTHETIC FIBERS

CHEMICAL ENGINEERING. Synthetic fibers. Chem. Eng. 58, no. 8: 125-32 (August, 1951).

A review of the general production techniques, principal producers, properties, methods of dyeing, and uses is presented for the following synthetic fibers: viscose rayon, cellulose acetate, nylon, polyacrylonitrile (Orlon), acrylic copolymers (dynel), polyesters (Dacron), vinyls (saran), zeins (Vicara), and glass fibers. 1 illustration and 6 flow diagrams. M.W.

TENSION WOOD

JAYME, GEORG. The significance of the tension-wood content in poplarwood. Holz Roh- u. Werkstoff 9, no. 5: 173-5 (May, 1951). [In German] *cf.* B.I.P.C. 20: 747-8.

Although there is no marked difference in fiber length between tension (I) and normal (II) wood, peak differences were noted in the kiln-dried weights. Sulfate pulps made from a 30-year old *Populus trichocarpa* showed that (I) contained much more α-cellulose than did (II), but that the breaking lengths and folding endurances of (I) were far below those of (II), because the hemicellulose content of (I) was much less than the optimum required for good strength properties. The practical aspects of tension wood are discussed, and the author points out that the percentage of (I) in wood will demand careful attention in any future utilization of poplarwood. 2 tables, 2 figures, and 8 footnotes. L.E.W.

TUNICIN

GELLENDIEN, WALTER. Animal cellulose. Melliand Textilber. 32, no. 6: 417-18 (June, 1951). [In German; English, French, and Spanish summaries]

Reference is made to the occurrence of cellulose (tunicin) in certain

classes of animals (*Tunicata*) and to the scant literature on this subject. It is suggested that the study of animal cellulose be included in the advanced research on the structure of cellulose of plant origin. 8 references. E.S.

MEYER, KURT H., HUBER, L., and KELLENBERGER, E. The texture of animal cellulose. Experientia 7, no. 6: 216-17 (June, 1951). [In French; English summary]

Electron micrographs of animal cellulose (tunicin of *Phallusia mammillata*, one sample taken from a living animal, the other from a specimen preserved in alcohol) show continuous fibrils of a width of 200 A. The fibrils are flat and seem to exhibit a longitudinal periodicity of 200 A. Anastomoses have not been observed. 2 electron micrographs and 11 footnotes. E.S.

ULTRASONICS

BRUSH DEVELOPMENT COMPANY, *Cleveland.* Ultrasonics in processing. Chem. Eng. 58, no. 8: 200, 202 (August, 1951).

Brush Hypersonic units are being installed as components of a water-treatment plant for a paper mill. Suspended fiber particles too small for screening are grouped and aligned by high-intensity waves so that they can be removed from streams. This represents the first industrial use of ultrasonic equipment by the company, but applications in other process industries are anticipated. 3 illustrations. M.W.

VENTILATION

LEPEZ, L. Ventilation and air conditioning in the paper industry. Bull. assoc. tech. ind. papetière 5, no. 4: 206-23 (June, 1951). [In French]

The following problems are discussed: the ventilation of the grinder room, beater room, and paper-machine room, the last-mentioned with and without the installation of a paper-machine hood; the recovery of heat from the discharged moist air; the distribution of air at the ceiling of the paper-machine room; personnel comfort, especially in summer and between seasons; and automatic regulation of installed ventilating and conditioning equipment. 10 figures. L.E.W.

WATER-MARKS

ANON. Watermarks. Papetier 5, no. 6: 71 (June, 1951). [In French]

Following a brief historical introduction, the mechanical processes for watermarking on the machine are outlined, including genuine watermarks made with the aid of dandy rolls, and impressed and embossed watermarks made with engraved or embossing rolls. E.S.

WEATHER FORECASTING

LEAVER, J. M. Long range forecasting. Pulp Paper Mag. Can. 52, no. 8: 109-10, 112 (July, 1951).

The distinction between short- and long-range weather forecasting is explained, and the various factors involved in each are discussed. M.W.

WOOD

RUNKEL, R. O. H., and WILKE, K.-D. Contribution to the thermoplastic behavior of wood. II. Holz Roh- u. Werkstoff 9, no. 7: 260-70 (July, 1951). [In German] *cf.* B.I.P.C. 21: 737.

Details are given of the apparatus and techniques used in making plastic materials under hydraulic pressure and at elevated temperatures. The wood meals used were beech and spruce (analyzed for chlorite holocellulose, lignin, and extractives). The analytical techniques which are fully described were applied to the original woods as well as to products after thermoplasticization. Four series of experiments were run: (1) in which only the temperatures were varied between 142 and 194°C.; (2) in which only the heating periods were varied from two to 45 minutes; (3) in which the initial compression of the wood meal varied so that the densities ranged from 0.7 to 1.35 g./cc.; and (4) in which the moisture contents ranged from 5 to 29%. The strength properties of the various products, their swelling behavior, chemical components, insoluble matter, etc., are shown graphically, and these changes in physical and chemical properties are discussed at some length. There appear to be two phases in the thermoplastic process: hydrolysis, followed by condensation. In the second phase, resinlike products result which impart hydrophobic and adhesive properties. The polyoses (hemicelluloses), especially xylans, appear to play an important part in this plasticization process, in which presumably furfural condensations take place. The role played by mannans in spruce has not been determined, but is probably slight. Changes in acidity with increasing temperature are tabulated. 2 tables, 12 graphs, and 25 references. L.E.W.

WOOD—CHEMISTRY

SAVARD, J. The problem of classifying tropical woods with respect to their utilization. Bull. assoc. tech. ind. papetière 5, no. 5: 271-81 (July, 1951). [In French]

The alcohol-benzene extractives, hot-water solubility, 1% sodium hydroxide solubility, and the percentage of lignin, cellulose, furfural, and ash were determined in several hundred species of tropical woods; the results are not reproduced. Instead, the author calculated the mean (I) and the most "probable" values (II) for all woods examined, with the exception of those from Guadeloupe (III) for which they were calculated separately. (I) and (II) were respectively: cellulose, 47.5%, —; lignin, 32 and 34%; alcohol-benzene solubility, 5.2 and 1.8%; furfural, 9.6%, —; hot-water solubility, 2.6 and 1.6%; and ash, 1.1 and 0.8%. Woods from (III) showed markedly lower (I) and (II) for lignin, but slightly higher values for cellulose and furfural. It was impossible to find any correlation between these analytical data and the properties of the woods, and the results are so widely dispersed that the author suggests that a coefficient of variation should always complement analytical studies. He proposes the following tests which depend on wood hydrolysis: the wood sample is hydrolyzed by the Scholler method, neutralized to pH 8, filtered and reacidified to pH 4.8-5.2, and treated with proper nutrients and *Saccharomyces sp.* Whereas all dilute hydrolyzates showed normal fermentation values (IV) and excellent Pasteur coefficients (V), differences in the various woods were noted when the hydrolyzates were concentrated. In some instances, both (IV) and (V) remained unchanged; in other cases (IV) remained unchanged, but (V) decreased, or vice versa, and in still other instances, both decreased. These decreases all represent a toxic property in the wood hydrolyzates which may serve to characterize certain species. Another means of characterizing the woods is by their rates of hydrolysis of the wood polysaccharides to simple sugars (*cf.* Saeman, B.I.P.C. 15: 226). Finally, a "corrected" cellulose figure may be of value in classifying tropical woods. The author also reviews in some detail the work of Holmberg and Gralén, Lange, and Svedberg. 1 table and 8 references. L.E.W.

WOOD—EXTRACTIVES

VIALLE, J. Constituents of waxes extractible from wood by

means of organic solvents. Bull. assoc. tech. ind. papetière 5, no. 5: 281-6 (July, 1951). [In French]

Although the title indicates that this article deals with waxes, the author actually outlines a general scheme of isolation for most types of wood extractives. Special attention is given various lignans (resinols). 14 references. L.E.W.

WOOD—MENSURATION

LANGSAETER, ALF. Should the existing price scales and systems of timber mensuration in Norway be altered? Norsk Skogind. 5, no. 7: 206-9, 211; discussion: 211-12 (July, 1951). [In Norwegian; English summary]

A survey is presented of the work and recommendations of a special committee which was appointed for considering changes in the present Norwegian system of wood mensuration of spruce and pine. The committee has tried to find a system which makes it possible to pay for the timber according to quality. It is suggested that only one diameter class be used in the case of timber measured by the mean diameter at the middle of log; however, the maximum lengths should be reduced. 3 tables and 1 figure. E.S.

WOOD TRANSPORTATION

BERG, EGIL, and ANKER-RASCH, OLE. Transportation problems in the forest industries. Norsk Skogind. 5, no. 3: 80, 82; no. 6: 188-9 (March, June, 1951). [In Norwegian] *cf.* B.I.P.C. 21: 590-1.

A polemic discussion by the first author and a reply by the second are presented. 1 table. E.S.

WIBSTAD, KJELL. The transportation problems of the forest industries. Norsk Skogind. 5, no. 7: 217-22 (July, 1951). [In Norwegian; English summary]

The problems involved in the transportation by rail and water of timber of small dimensions and recommendations by the Norwegian Transport Committee of the Forestry and Forest Industries Research Association are discussed. 9 figures. E.S.

X-RAY RESEARCH

HERMANS, P. H. X-ray investigations on the crystallinity of cellulose. Makromol. Chem. 6, Staudinger-Festband: 25-9 (March, 1951). [In English; German summary]

A summary is given of the results obtained with x-ray studies for determining the degree of crystallinity of native and regenerated cellulose fibers; the technique has previously been described in detail (*cf.* B.I.P.C. 18: 719-20; 19: 736-7). All native fibers examined showed the same crystallinity of about 70%; pulps prepared from bamboo and wood fall within the range of 55 to 70%, whereas bacterial cellulose yielded the lowest figure (40%). The majority of cottons, no matter what their degree of orientation, mechanical strength, or manufacturing process, have an equal crystallinity of about 40% (within experimental error), with only two exceptions (Fortisan, 49% and Fiber G, 53%). These results are in agreement with moisture absorption data and estimations of crystallinity from other physical methods. A considerable decrease in crystallinity can be brought about by the mechanical

treatment of dry cellulose fibers (vibrating ball mill); such samples recrystallize upon wetting with water, and again reach about 40% crystallinity. 2 tables and 6 references. E.S.

KAST, W. X-ray investigations of the structure of cellulose fibers. I. Melliand Textilber. 31, no. 2: 83-8 (February, 1950). [In German; English, French, and Spanish summaries]

A detailed account is given of x-ray studies into the crystalline structure of native, mercerized, and regenerated cellulose fibers in the three stages: elementary cell, spatial group, and complete crystalline model. Various conjectures as to the micellar structure and the arrangement of the molecule are discussed (particularly the models proposed by Meyer and Misch, Schiebold, and Hermans and Weidinger) and illustrated in diagrams. 5 tables, 8 figures, and 5 references. E.S.

KAST, W. X-ray investigations of the structure of cellulose fibers. II. Melliand Textilber. 32, no. 5: 361-3; no. 6: 442-6 (May, June, 1951). [In German; English, French, and Spanish summaries]

In the second part of the article, the methods of x-ray measurement of the orientation of rodlike and platelike particles of the cellulose crystals are discussed, as well as their influence on the phenomena of stretch. A comparison is made of conditions found in the spinning of viscose, Lilienfeld, and cuprammonium rayon. 14 figures and 5 references. E.S.

MEREDITH, R. Cotton fibre tensile strength and x-ray orientation. J. Textile Inst. 42, no. 7/8: T291-9 (July/August, 1951).

The tensile strength of single fibers and of flat bundles of fiber for 14 samples of cotton was correlated with the orientation of the crystallites as measured by x-rays, and the magnitude of the correlation coefficient was found to range from 0.77 to 0.84, which is too low to permit an accurate prediction of strength from x-ray orientation. The lack of correlation between x-ray orientation and strength may be explained by the varying degrees of influence on these properties by variations in the convolution angle within a variety and maturity. When the average convolution angles of different varieties of cotton are correlated with strength, the coefficient is not significantly different from that for x-ray orientation and strength, and the good correlation between x-ray angle and the convolution angle suggests that the spiral of the crystallites in all cottons in the original unconvoluted form may be the same. 4 tables, 4 figures, and 17 references. M.W.

MEREDITH, R. On the technique of measuring orientation in cotton by x-rays. J. Textile Inst. 42, no. 7/8: T275-90 (July/August, 1951).

The degree of crystallite orientation was measured for 14 cottons and was expressed in three ways, first by the angular displacement from the point of blackening on the (002) diffraction arc to the point where the absorption is 40% of the maximum. The second method, developed by the author, employs a calibration strip on each film which allows the transmitted intensity readings to be converted directly into the corresponding x-ray intensities, independent of the opacity of the film or of the particular characteristics of the microphotometer used. The third method gives the average angle of inclination to the fiber axis of the chain molecules in the crystalline regions. The second method requires less rigid standardization of experi-

mental conditions and gives angles which are highly correlated with those given by the first method. The average orientation angle does not correlate as well with the 40% x-ray angle as a result of differences in the shape of the x-ray intensity distribution curves for the (002) arcs of different cottons. 5 tables, 5 figures, and 14 references. M.W.

MUKHERJEE, R. R., and WOODS, H. J. An x-ray study of the transition from water-cellulose to cellulose II in ramie, jute and sisal. J. Textile Inst. 42, no. 7/8: T309-13 (July/August, 1951).

The transition from water cellulose to cellulose II in ramie, sisal, and jute was examined by x-ray methods, and it was found that, as the humidity is reduced, the intracrystalline readjustments in lignified fibers (jute and sisal) are not made as rapidly as those in ramie. It is probable, therefore, that the presence of lignin must, in some way, impede the process of molecular readjustment which leads from water cellulose to the true cellulose II configuration. The discrepancy of the results of various investigators in the determination of intracrystalline swelling of these fibers may be due to differences in the degree of perfection of the crystalline cellulose II. The effect of tension on both water cellulose and the transition products and on soda cellulose seems to be the tendency to pull the system toward the nearest stable state, either cellulose I or II. 2 tables and 8 references. M.W.

YEAST

INSKEEP, GORDON C., WILEY, A. J., HOLDERBY, J. M., and HUGHES, L. P. Food yeast from sulfite liquor. Ind. Eng. Chem. 43, no. 8: 1702-11 (August, 1951).

This is a staff-industry collaborative report, in which the procedures developed by the Sulphite Pulp Manufacturers' Research League for the production of *Torulopsis utilis* from spent sulfite liquor and the operations now going on in the plant of the Lake States Yeast Corp. located at the Rhinelander Paper Co., Rhinelander, Wis., for its manufacture are described. The report includes a flowsheet and analytical and operating data. The yeast produced has a high-protein and high-vitamin content. The protein content constitutes about half the total weight, and the yeast compares favorably with milk and meat in amino acid composition. The reduction in B.O.D. of the effluent averaged 59.7% in 1950; individual 24-hour composites ran as high as 70%, and pilot-plant data have demonstrated the possibilities of a 75% B.O.D. efficiency by the yeast process. 5 tables, 1 flowsheet, 10 figures, and 24 references. H.F.L.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ADHESIVES

Goss, WORTH C. Reaction base material. U. S. patent 2,563,836. Filed Oct. 18, 1947. Issued Aug. 14, 1951. 2 claims. Assigned to Edward S. Heller. [Cl. 260-124]

A chemical reaction product which is prepared from brown rotted wood is effective as a binder or glue for use in the manufacture of sheet lumber from ground or fiberized wood. The process comprises the steps of reducing the rotted wood to a degree comparable with that of ground coffee; heating the reduced material in a water bath at about 150°F.; adding ammonium hydroxide to the agitated mixture until the solid material has a pH of 5.5-9.0; separating the solid material from the liquid; washing the material in fresh water until the wash water shows no discoloration; and grinding the washed material to a pastelike consistency. E.G.S.

BLEACHING—SULFATE

COLLIN, PER H., and JONSSON, JOHN H. Methods in the bleaching of cellulosic materials. Canadian patent 475,209. Filed April 19, 1949. Issued July 10, 1951. 7 claims. Assigned to Stora Kopparbergs Bergslags Aktiebolag.

A method is described for the bleaching of a kraft pulp which has been prebleached with at least one bleaching agent selected from the group consisting of chlorine and hypochlorite to a G.E. brightness of 60. The end bleaching process is carried out in at least one step with chlorine dioxide (2-10 kg. of available chlorine per metric ton of prebleached pulp) over a pH range of 5-8; the resultant bleaching liquor is activated with chlorine gas, its pH is adjusted by the addition of hydrochloric acid, and it is used for the bleaching of the initial pulp. 4 figures. E.G.S.

BOARD

HAMBURG, HERMAN. Manufacture of articles such as boards and sheets from fibrous organic materials. Canadian patent 473,674.

Filed Sept. 6, 1947. Issued May 15, 1951. 31 claims. Assigned to Syntics Limited.

A process is described for the manufacture of hard, moisture-resistant molded board from fibrous vegetable waste (e.g., sawdust, shavings, straw, bagasse, hemp, coir, or peat). As an example, sawdust is mixed with 10 times its weight of a 1.5% caustic soda solution and treated for three hours at a steam pressure of 40 p.s.i. The digested material is washed free of excess caustic soda and discharged. Sufficient water is removed mechanically to reduce the water content to 50%, and the mass is impregnated with a 5% calcium hypochlorite solution. The impregnated pulp is diluted with water to form a 7% slurry. Under continuous agitation, an aluminum sulfate solution is added in sufficient quantity to reduce the pH of the slurry to 4.5. The resultant stock is suitable for shaping in accordance with standard practice. E.G.S.

HERITAGE, CLARK C. Molding fiber composition. U. S. patent 2,553,412. Filed Dec. 13, 1943. Issued May 15, 1951. 4 claims. Assigned to Wood Conversion Company. [Cl. 92-3]

A method is described for the manufacture of a resin-fiber molding composition. As an example, peeled aspen chips are defibered in a steam atmosphere at about 350°F. for about one minute, in the presence of an aqueous solution of a phenol-aldehyde resin which contains 80.6% resin solids. The resin and wood are fed into an Asplund-type unit at a controlled rate to produce a mass of fiber-resin which contains 30 or 50% resin. The resulting product is a feltable molding composition in which the reactive resin is advanced. E.G.S.

BOARD, ASBESTOS

ANDERSON, HARVEY R. Insulation board. U. S. patent 2,565,340. Filed June 8, 1949. Issued Aug. 21, 1951. 8 claims. Assigned to Keasbey and Mattison Company. [Cl. 106-86; changed to 106-99]

An insulation board which is suitable for use in bulkheads, fire barriers, and heat-insulating walls is composed essentially of chrysotile asbestos fibers, fine silica, and hydrated lime. E.G.S.

BOARD, BUILDING

CAMP, THOMAS P. Plasterboard. U. S. patent 2,562,859. Filed Jan. 10, 1947. Issued July 31, 1951. 4 claims. Assigned to United States Gypsum Company. [Cl. 154-45.9]

A gypsum-core, paper-covered plasterboard is coated on at least one surface with about one gallon per 1000 square feet of surface of about a 5% solution of commercial potassium carbonate. The solubilizing action of the potassium carbonate on the rosin size in the cover sheets decreases the waterproofing effect of the size. When plaster is applied to the treated surface, it enters the pores and interstices of the paper liner. The crystals of gypsum which are formed during the setting of the plaster interlace within the pores and interstices of the treated surface, and a good bond is obtained. E.G.S.

SMITH, WARREN R., MELLENGER, EDMUND R., and OTHMER, DONALD F. Process of making a molded article from lignocellulose. U. S. patent 2,552,597. Filed July 9, 1947. Issued May 15, 1951.

3 claims. Assigned to Donald F. Othmer, William R. White, Jr., and Louis Ricciardi. [Cl. 106-163]

A hard, dense, strong, water-resistant wallboard is produced from wood waste (e.g., sawdust, shavings, and other mill waste from deciduous or coniferous wood) by adding 3-6% (based on the weight of wood) of amorphous sulfur to the waste and subjecting the mixture to a pressure of 720-780 p.s.i. at 225-250°C. Chemical bonding is thus effected between the sulfur and the wood particles to produce a uniform solid. E.G.S.

BOARD, INSULATING

GESSLER, ALBERT E., GRUPE, WILLIAM F., ROLLE, CLIFFORD J., and TUTTLE, FRANCIS J. Method of producing heat and sound insulation. U. S. patent 2,562,711. Filed Feb. 25, 1948. Issued July 31, 1951. 2 claims. Assigned to Interchemical Corporation. [Cl. 154-110]

A sound- and heat-insulating board comprises a laminate of a relatively thin film of a plastic foil (e.g., cellulose acetate, ethylcellulose, polyvinyl chloride-acetate copolymer, or the like) and a relatively thick backing of Celotex or Fiberlite board. The foil is perforated over about 5-20% of its area. The product is suitable for interior installations in automobiles and aircraft. 5 figures. E.G.S.

BOARD SPECIALTIES

ADDISON, JOHN S. Shipping pallets and containers. Canadian patent 474,901. Filed March 17, 1949. Issued July 3, 1951. 8 claims. Assigned to Addison-Semmes Corporation.

A combination pallet and shipping container which is formed of corrugated board is designed to receive and protect the projecting portions of the article being shipped (e.g., a sofa, lounge, or the like). 7 figures. E.G.S.

BURR, NED. Display device. U. S. patent 2,564,672. Filed July 15, 1947. Issued Aug. 21, 1951. 11 claims. Assigned to Chicago Cardboard Company. [Cl. 211-135]

A cardboard display device which is designed for use on store counters incorporates several shelves upon which a number of articles of merchandise can be arranged. 11 figures. E.G.S.

CHIDSEY, FRANCIS A., JR. Can holders. Canadian patent 475,138. Filed May 31, 1950. Issued July 10, 1951. 7 claims. Assigned to Container Corporation of America.

A can holder which is adapted for the retention of two or more cans in a unitary pack is formed as a paperboard band which encircles the cans; the device incorporates tabs or flaps which are bent inwardly to engage the chimes of the outermost, projecting cans to prevent their movement from the holder. 8 figures. E.G.S.

DWYER, JOSEPH P. Container. U. S. patent 2,561,504. Filed April 25, 1947. Issued July 24, 1951. 7 claims. Assigned to Cluett, Peabody & Co., Inc. [Cl. 206-44; changed to 206-45.14]

A cardboard container which is suitable for the storage and display of

neckties incorporates a paper flysheet which is held in place by a cardboard sheet located in the bottom of the box. 6 figures. E.G.S.

EMRICK, CLYDE L. Bottle carrier. U. S. patent 2,565,449. Filed Jan. 8, 1948. Issued Aug. 21, 1951. 3 claims. Assigned to Morris Paper Mills. [Cl. 229-52]

A paperboard bottle carrier incorporates a multi-ply, reinforced handle. 6 figures. E.G.S.

EPPS, THOMAS B. Display boxes. Canadian patent 474,877. Filed June 22, 1948. Issued July 3, 1951. 1 claim.

Each section of a combination display and storage box for shoes is constructed in such a manner that its side walls are trapezoidal and its chimes co-operate with the chimes of the other section. 7 figures. E.G.S.

GUYER, REYNOLDS. Bottle carrier. U. S. patent 2,565,683. Filed Aug. 5, 1948. Issued Aug. 28, 1951. 11 claims. Assigned to Waldorf Paper Products Company. [Cl. 224-48]

A paperboard bottle carrier comprises a U-shaped tray to which is attached a U-shaped wire handle. 3 figures. E.G.S.

GUYER, REYNOLDS. Bottle carrier. U. S. patent 2,565,810. Filed Aug. 5, 1948. Issued Aug. 28, 1951. 7 claims. Assigned to Waldorf Paper Products Company. [Cl. 224-48]

A paperboard bottle carrier consists of a U-shaped tray and a carrying handle which is formed from a single length of wire rod or the like. 4 figures. E.G.S.

HOLT, GEORGE W., JR. Disposable bag for vacuum cleaners. U. S. patent 2,564,845. Filed March 7, 1946. Issued Aug. 21, 1951. 2 claims. Assigned to Marathon Corporation [Cl. 183-51]

A paper carton which is adapted for use as a filter unit in vacuum cleaners is provided with an inner lining of cellulose wadding, soft crepe paper wadding, hair, excelsior, or the like. 9 figures. E.G.S.

KAHN, LAWRENCE M. Shirt form. U. S. patent 2,563,043. Filed Nov. 19, 1949. Issued Aug. 7, 1951. 1 claim. [Cl. 223-71]

A cardboard shirt form incorporates a central tab portion which is provided with a zigzag slot through which one of the shirt buttons may engage and clamp the tab against the folded bottom portion of the shirt. 4 figures. E.G.S.

PERINO, DOMINIC A. Commodity bag. U. S. patent 2,563,616. Filed Oct. 5, 1949. Issued Aug. 7, 1951. 2 claims. Assigned to Milprint, Inc. [Cl. 150-11]

A marketing bag comprises a flexible, transparent body (e.g., rubber hydrochloride) and a relatively rigid cardboard strip which is secured to the top edge of the body. A drawstring which is interlaced through holes in the strip is used to collapse the strip in accordion fashion and thus to close the mouth of the bag. 5 figures. E.G.S.

PRICE, CHARLES S. Bottle carrier. U. S. patent 2,563,065. Filed June 22, 1946. Issued Aug. 7, 1951. 1 claim. Assigned to Reynolds Metals Company. [Cl. 229-52]

A foil-covered paperboard bottle carrier incorporates bottle-gripping flaps which are integrally attached to stiffening struts in the side walls of the carrier. 12 figures. E.G.S.

PUCKETT, RICHARD E. Display package for drills or the like. U. S. patent 2,563,959. Filed Sept. 25, 1947. Issued Aug. 14, 1951. 5 claims. Assigned to United Drill and Tool Corporation. [Cl. 206-78]

A laminated cardboard display package is adapted to receive a set of graduated metal drills. 13 figures. E.G.S.

RINGLER, WILLIAM A. Automatically partitioned carrier device. U. S. patent 2,563,620. Filed Aug. 14, 1945. Issued Aug. 7, 1951. 2 claims. Assigned to The Gardner Board and Carton Co. [Cl. 229-28]

A knockdown paperboard bottle carrier incorporates integral partition members which are automatically erected when the carrier is set up to receive bottles. 11 figures. E.G.S.

RINGLER, WILLIAM A. Method of applying end closures to containers. U. S. patent 2,562,579. Filed Aug. 29, 1944. Issued July 31, 1951. 2 claims. Assigned to The Gardner Board and Carton Co. [Cl. 93-55.1]

A liquidtight paperboard container which is adapted for hermetic sealing embodies sufficient strength and rigidity in the closure to protect a relatively weak paraffin seal. 15 figures. E.G.S.

RINGLER, WILLIAM A. Stabilized paperboard carrier. U. S. patent 2,564,449. Filed July 12, 1949. Issued Aug. 14, 1951. 11 claims. Assigned to The Gardner Board and Carton Co. [Cl. 229-28]

A rigid paperboard bottle carrier is adapted for use in conjunction with automatic loading machines. 12 figures. E.G.S.

WINKLER, ELMER L. Folding tray. U. S. patent 2,563,145. Filed Dec. 29, 1948. Issued Aug. 7, 1951. 5 claims. Assigned to Mott Carton and Paper Company. [Cl. 229-34]

A prefolded cardboard container blank is adapted for erection to form a corner-locking open tray for the packaging of baked goods, fruits, vegetables, and the like. 10 figures. E.G.S.

BOARD TESTING—PHYSICAL

HOLLIS, ROBERT F. Apparatus for testing paperboard with controlled pressure. U. S. patent 2,565,371. Filed July 31, 1946. Issued Aug. 21, 1951. 2 claims. Assigned to Alton Box Board Company. [Cl. 73-102]

A standard Mullen tester is modified in such a manner that the pressure which is applied to the test specimen can be predetermined and standardized; the conventional handwheel and screw are replaced by a fluid pressure-energized device for actuating the clamping jaws of the tester. 2 figures. E.G.S.

CONTINUOUS COOKING PROCESS

HUGUENOT, HILARIO. Mechanical devices and apparatus for the continuous manufacture of compressed cellulose from straw, alfa and other plants. Canadian patent 475,589. Filed Sept. 28, 1948. Issued July 31, 1951. 3 claims.

An apparatus for the continuous production of compressed cellulose from straw, esparto grass, and the like comprises a combined grinder and digester, a tube for the further digestion of the material, and an extractor for the separation of the residual liquor from the cellulose. 3 figures. E.G.S.

DE-INKING

FENNELL, FRANCIS L. Recovery of paper stock. Canadian patent 475,350. Filed Nov. 26, 1948. Issued July 17, 1951. 6 claims. Assigned to E. I. du Pont de Nemours & Company.

A waste-paper recovery process comprises the steps of pulping waste paper (e.g., newsprint, telephone directories, magazine or ledger stock, or a mixture thereof); subjecting the resulting pulp to the action of aqueous caustic soda solution at 90-200°F. for 0.5-4 hours; diluting the treated pulp to a consistency of 0.25-2% by mixing it with a dilute sodium hypochlorite solution the concentration of which is equivalent to 10-200 p.p.m. of total chlorine; washing the pulp to remove nonfibrous materials; and subjecting the washed pulp to peroxide bleaching. 1 figure. E.G.S.

DISPENSING CONTAINERS

COCHRAN, CLARENCE W. Container for disposable tissues. U. S. patent 2,566,016. Filed June 7, 1947. Issued Aug. 28, 1951. 2 claims. [Cl. 229-15]

A two-compartment paperboard container for disposable tissues comprises an upper compartment for the storage and dispensing of the tissues, and a lower compartment for the reception of soiled or used tissues. 14 figures. E.G.S.

FALK, MARIAN C. Pour container. U. S. patent 2,561,568. Filed Feb. 15, 1949. Issued July 24, 1951. 2 claims. [Cl. 229-17]

A waxed-paper container which is adapted for the packaging of milk, cream, cereal, or the like is so constructed that a tight seal is obtained. The folded portions of the top of the carton can be opened to provide a nondrip pouring spout or channel. 8 figures. E.G.S.

MAXON, KARL E. Carton construction. U. S. patent 2,565,182. Filed Oct. 24, 1947. Issued Aug. 21, 1951. 14 claims. [Cl. 229-17]

A carton which is suitable for the packaging of powdered or flaked material is provided with an integral pouring spout which incorporates several radiating V-shaped troughs. 14 figures. E.G.S.

FOAM

MCGINN, EARL P. Defoaming agent for pulp and paper stock.

U. S. patent 2,563,856. Filed Oct. 12, 1945. Issued Aug. 14, 1951. 5 claims. Assigned to Nopco Chemical Company. [Cl. 252-358]

An antifoaming agent for pulp and paper stock comprises a water emulsion which contains 20% scale wax, 2% candelilla wax, 15% glyceryl monostearate, and the reaction product of about 5% of castor fatty acid and 2.3% of a 23.5% sodium hydroxide solution (all compositions by weight). The balance of the emulsion is water. E.G.S.

MCGINN, EARL P. Defoaming agent for pulp and paper stock. U. S. patent 2,563,857. Filed Oct. 12, 1945. Issued Aug. 14, 1951. 5 claims. Assigned to Nopco Chemical Company. [Cl. 252-358]

An antifoaming agent for pulp and paper stock comprises a water emulsion which is prepared from about 16% of scale wax, 1.6% of candelilla wax, 12% of glyceryl monostearate, 10% of methyl oleate, and the reaction product of about 5.6% of stearic acid and 1% of potassium hydroxide (all compositions by weight); the balance of the emulsion is water. E.G.S.

FOLDING BOXES

BUTTERY, KENNETH T. Collapsible cellular carton. U. S. patent 2,562,233. Filed Nov. 1, 1945. Issued July 31, 1951. 5 claims. Assigned to Sutherland Paper Company. [Cl. 229-28]

A cellular egg carton is designed to accommodate large-size eggs without bulging the side walls of the receptacle or exposing the eggs to breakage. This is the same as Canadian patent 468,708; *cf.* B.I.P.C. 21: 209. E.G.S.

COLLINS, WILLIAM L. Container. U. S. patent 2,562,261. Filed Feb. 12, 1949. Issued July 31, 1951. 5 claims. Assigned to Morris Paper Mills. [Cl. 229-16]

A paperboard, folder-type container incorporates a pair of oppositely disposed closure flaps having generally tapering end portions which are adapted to be overlapped and interlocked to close one face of the container. 3 figures. E.G.S.

DOBBELMANN, ARNOLDUS A. Blanks for wedge shaped containers. U. S. patent 475,847. Filed Aug. 4, 1948. Issued Aug. 7, 1951. 2 claims. Assigned to Dobbelman N.V.

A wedge-shaped container for collapsible tubes (e.g., toothpaste tubes) is constructed in such a manner that the cap of the tube is exposed. 2 figures. E.G.S.

DUNNING, ROBERT M. Carton end closure structure. U. S. patent 2,564,099. Filed May 3, 1947. Issued Aug. 14, 1951. 1 claim. Assigned to Waldorf Paper Products Company. [Cl. 229-17]

The end flaps of a carton are provided with apertures so that the innermost glue flaps can be drawn against the outer flaps by vacuum during the sealing operation. 7 figures. E.G.S.

GUYER, REYNOLDS. One-piece reinforced carton. U. S. patent 2,565,682. Filed June 19, 1946. Issued Aug. 28, 1951. 8 claims. Assigned to Waldorf Paper Products Company. [Cl. 229-16]

A one-piece reinforced carton which is provided with double-thickness opposed side walls can be folded flat for shipment. 6 figures. E.G.S.

MELLER, REGINALD B. Folding box construction. Canadian patent 475,809. Filed May 31, 1948. Issued Aug. 7, 1951. 14 claims. Assigned to Bemiss-Jason Company.

A cardboard container which is adapted for the packaging of solid (e.g., butter) or flaky material (e.g., potato chips) incorporates a heat-sealed vaportight corner construction. 34 figures. E.G.S.

O'BRIEN, GILBERT F. Paper container. U. S. patent 2,562,570. Filed Feb. 10, 1948. Issued July 31, 1951. 10 claims. [Cl. 229-23]

A two-piece paper container is adapted for the packaging of fresh fruits and vegetables. The main blank provides the top, sides, and ends of the carton, and the smaller blank forms the bottom; the two blanks are fastened together with staples. 4 figures. E.G.S.

RINGLER, WILLIAM A. Paperboard carton capable of holding liquids. U. S. patent 2,563,619. Filed June 13, 1945. Issued Aug. 7, 1951. 1 claim. Assigned to The Gardner Board and Carton Co. [Cl. 229-37]

A paperboard container which is adapted for hermetic sealing is rendered liquidtight without the subjection of the end closures to a dipping operation. The seal is accomplished by the application of heat to end flaps which are coated with a thermoplastic adhesive. 14 figures. E.G.S.

STENGER, RICHARD C. Telescoping box or carton having interlocking wall elements. U. S. patent 2,565,053. Filed July 7, 1949. Issued Aug. 21, 1951. Assigned to Sutherland Paper Company. 7 claims. [Cl. 229-35]

A telescoping box incorporates a corner-locking construction; the parts of the carton are so arranged as to permit engagement of the cover with the body without displacement of the interlocking parts of the cover. 8 figures. E.G.S.

WELSHENBACH, CHARLES D. Polygonal box. U. S. patent 2,565,188. Filed Nov. 4, 1948. Issued Aug. 21, 1951. 2 claims. Assigned to The Hinde & Dauch Paper Company. [Cl. 229-16]

A polygonal paperboard box of eight or more sides can be folded flat for shipment or storage. 4 figures. E.G.S.

WORFFORD, ROBERT B. Unitary reinforced folding box. U. S. patent 2,565,288. Filed Jan. 10, 1948. Issued Aug. 21, 1951. 9 claims. Assigned to The Gardner Board and Carton Co. [Cl. 229-33]

A folding paperboard box is constructed in such a manner as to provide a reinforced, double-thickness rear wall which is integral with the side walls and top and bottom panels. 6 figures. E.G.S.

HEATING (INFRARED)

DECK, PHILIBERT. Processes and devices for drying webs of fabric and paper. Canadian patent 475,580. Filed July 19, 1947. Issued July 31, 1951. 2 claims.

A radiant-heat drier for a continuous web of paper or fabric incorporates two banks of infrared lamps and air nozzles, above and below the moving web. The lamps are installed alternately between the nozzles. 1 figure.
E.G.S.

INTERIOR PACKING

BELANGER, ALBERT P. D. Means for packaging articles for handling. U. S. patent 2,562,655. Filed Sept. 13, 1947. Issued July 31, 1951. 10 claims. Assigned to Alton Box Board Company. [Cl. 229-14]

A packaging device for light bulbs comprises a cylindrical paper tube which is designed to accommodate several bulbs, each of which is held in position in the tube by means of a cup-shaped paper holder. 7 figures.
E.G.S.

OKON, NATHAN. Spacing device for shipping cartons and the like. U. S. patent 2,565,146. Filed April 6, 1949. Issued Aug. 21, 1951. 2 claims. [Cl. 229-42]

A separator or spacing device for a shipping carton (e.g., for furs, millinery, and the like) is equipped with feet or supports which serve to space the separator from the bottom of the carton. 6 figures. E.G.S.

PAIGE, RICHARD E. Packaging member. U. S. patent 2,563,132. Filed July 3, 1947. Issued Aug. 7, 1951. 7 claims. [Cl. 229-42; changed to 229-28]

A scalloped corrugated board separator is adapted for insertion into a carton of jars, bottles, golf balls, or the like, to prevent the objects from knocking against one another. 6 figures. E.G.S.

LIGNIN

EVANS, RAYMOND N., and INGRASSIA, ANGELO P. Lignin resins and process of making same. U. S. patent 2,562,898. Filed May 24, 1946. Issued Aug. 7, 1951. 6 claims. Assigned to Masonite Corporation. [Cl. 260-17.3]

A process is described for the preparation of alkali- and water-resistant lignin resins. The cured resins are particularly effective as laminating materials in the manufacture of laminated paper, hardboard, and plywood. As an example, 126 parts of melamine, 260 parts of 37% formaldehyde, 98 parts of commercial furfuryl alcohol, and 31.5 parts of lignin are mixed and heated at about 55°C. for three hours to form a resinous solution; 84 parts of the resultant solution, 100 parts of acid-hydrolyzed lignocellulose fiber, and 242 parts of methyl Cellosolve are milled together in a Baker-Perkins mixer. After thorough mixing to form a mass of doughlike consistency, the resin-fiber mixture is placed in a wire basket and heated at about 70° in a vacuum oven for about six hours, so that the volatile content is reduced to about 5%. The material is ground so that it passes a 40-mesh screen. The ground material is placed in a mold, heated, pressed at 165° and 1750 p.s.i. for five minutes, and chilled while under pressure. The molded product has the following characteristics: specific gravity, 1.37; modulus of rupture, 12,950 p.s.i.; Rockwell M hardness, 100 (room temperature) and 94 (105°); 24-hour water immersion, 0.9% uptake; and 24-hour 1% alkali immersion, 0.9% uptake. E.G.S.

MACHINERY—CALENDERS

PUTNAM, CHARLES P. Calender machine. U. S. patent 2,565,520. Filed Nov. 3, 1945. Issued Aug. 28, 1951. 13 claims. Assigned to New York and Pennsylvania Co., Inc. [Cl. 92-71]

A tandem supercalender incorporates swingably mounted rolls which can be replaced without stopping the machine. This corresponds to Canadian patent 459,848; *cf.* B.I.P.C. 20: 141. E.G.S.

MACHINERY—CENTRIFUGAL SCREENS

KOZIOL, BERNARD J. Paper machinery. U. S. patent 2,563,249. Filed Oct. 28, 1948. Issued Aug. 7, 1951. 14 claims. Assigned to The Black-Clawson Company. [Cl. 92-29]

A vibrating screen is described in which the amplitude and frequency of oscillation of the vibrating member may be quickly and independently varied in accordance with desired screening conditions. The stock which is being screened is subjected to centrifugal and pumping actions, so that the unscreened stock is agitated, and the rejected material is caused to traverse a relatively long path without compacting. 6 figures. E.G.S.

MACHINERY—CONVERTING MACHINERY

AMBERG, WALTER E. Apparatus for forming rounded bottoms in conically shaped cups. U. S. patent 2,563,632. Filed Feb. 11, 1948. Issued Aug. 7, 1951. 1 claim. Assigned to Lily-Tulip Cup Corporation. [Cl. 93-36.2]

A mold die is adapted for the rounding of the bottom of a conical paper cup without impairment of the strength or permeability of the cup. 8 figures. E.G.S.

BENOIT, LEON, and VAHLE, RAYMOND. Automatic carton erecting machine. U. S. patent 2,561,776. Filed Dec. 5, 1945. Issued July 24, 1951. 24 claims. Assigned to Robert Gair Company, Inc. [Cl. 93-37]

A machine and method are described for the assembly and erection of a cellular carton from a pair of complementary slitted blanks. This is the same as Canadian patent 463,068; *cf.* B.I.P.C. 20: 531. E.G.S.

CLIFFORD, WALTER B., and WALTON, RICHARD R. Process and apparatus for molding sheet material. U. S. patent 2,565,949. Filed April 12, 1947. Issued Aug. 28, 1951. 10 claims. [Cl. 113-44]

Paperboard, fiberboard, pasteboard, or similar stock is molded in a wet or dry condition into three-dimensional shapes of well-defined contour, smoothly and without the formation of pleats, by initial engagement of the stock between flexible rubber diaphragms which hold it securely in a flat condition, and subsequent conformation of the blank by co-operating dies which act through the diaphragms. 8 figures. E.G.S.

FERGNANI, WALTER P. Folding box machine. U. S. patent 2,563,596. Filed June 5, 1946. Issued Aug. 7, 1951. 5 claims. Assigned to Post Machinery Company. [Cl. 93-49]

The folding belt of a boxmaking machine is combined with a delivery unit

which includes co-operating delivery and pressing belts that are arranged to receive the folded blank successively in endwise direction from the folding belt. Co-operating ironing rolls are located so as to engage a blank only after it has been completely received and flattened by the delivery and pressing belts. 5 figures. E.G.S.

GRANT, FRANK A. Paper strap forming machine. U. S. patent 2,562,454. Filed July 19, 1947. Issued July 31, 1951. 11 claims. Assigned to Paper Strap, Inc. [Cl. 270-94]

All parts of a high-speed, paper strap-forming machine are arranged so that a paper web may be threaded through the machine with a minimum of difficulty. The working parts of the unit are readily accessible for maintenance purposes. 9 figures. E.G.S.

NICHOLAS, JOHN. Apparatus for making paper and like bags. U. S. patent 2,565,258. Filed Aug. 27, 1947. Issued Aug. 21, 1951. 6 claims. Assigned to E. S. & A. Robinson, Limited. [Cl. 93-22]

A machine is adapted for the production of paper bags from a continuous length of tubular material. This corresponds to Canadian patent 462,896; *cf.* B.I.P.C. 20: 532. E.G.S.

PAGENDARM, JOHN F. Assembling paperboard boxes. Canadian patent 475,439. Filed May 31, 1948. Issued July 24, 1951. 15 claims. Assigned to Bemiss-Jason Company.

A machine is adapted for the automatic interlocking of the sides and ends of a tray-type box or carton, such as might be used for the packaging of doughnuts or other bakery products. This corresponds to U. S. patent 2,524,133; *cf.* B.I.P.C. 21: 211. E.G.S.

SILLARS, GEORGE S. Boxmaking machine. U. S. patent 2,561,485. Filed May 6, 1948. Issued July 24, 1951. 5 claims. Assigned to Hoague-Sprague Corporation. [Cl. 93-49]

A boxmaking machine incorporates a press member whose operation is initiated by pressure exerted through the bottom of a box by the operator against the end-wing extension folding plate. 9 figures. E.G.S.

WIXON, PAUL E., and CHAPMAN, CLARENCE E. Paper feed mechanism for cupmaking machines. U. S. patent 2,565,162. Filed Jan. 6, 1948. Issued Aug. 21, 1951. 5 claims. Assigned to Joseph Shapiro. [Cl. 271-2.5]

Means are provided for feeding paper from a continuous roll to the body-blanking dies of a cupmaking machine. 7 figures. E.G.S.

MACHINERY—CORRUGATING MACHINE

BOSSI, ALFRED. Machines for the production of packaging inlays. Canadian patent 475,258. Filed Nov. 17, 1948. Issued July 17, 1951. 8 claims.

A machine is adapted for the production of packaging inlays for medicinal ampoules from two continuous paper webs. One of the paper webs is corrugated; each alternate corrugation is supported with a mandrel; pressure is applied to the sheet until the walls of the unsupported corrugations make

contact below their crowns; adhering the second paper web as a base sheet to the under surface of the corrugated web; and withdrawing the mandrels. 4 figures. E.G.S.

MACHINERY—CUTTERS

HORNBOSTEL, LLOYD. Sheet cutters. Canadian patent 475,642. Filed Aug. 16, 1947. Issued July 31, 1951. 15 claims. Assigned to Beloit Iron Works.

A sheet cutter which is designed for severing individual sheets from a traveling web of paper or paperboard includes means for feeding the web to the cutter knife at an angle of approach of about 45° and for forcing the severed sheet away from the path of movement of the knife. 8 figures. E.G.S.

MACHINERY—DRYERS

OSTERTAG, HARRY M., and MASSHARD, JOHN H. Yankee drier. U. S. patent 2,563,692. Filed Sept. 21, 1944. Issued Aug. 7, 1951. 9 claims. Assigned to Scott Paper Company. [Cl. 257-95]

A Yankee drier is described which is capable of safe operation at steam pressures considerably greater than those heretofore found practicable. Both end pressure and water load are reduced to a practical minimum by the incorporation of a double shell; this feature reduces stress and deflection in the heads and shell and also diminishes the hazard of large volumes of escaping steam if failure should occur. 7 figures. E.G.S.

MACHINERY—FILTERS

CHASE, CHARLES B. Filter cartridge. U. S. patent 2,564,637. Filed Feb. 23, 1950. Issued Aug. 14, 1951. 3 claims. Assigned to Fram Corporation. [Cl. 210-169]

The filter element of a filter cartridge comprises a tubular core around which two parallel paper webs are spirally coiled. The webs are spaced from each other by a sheet of corrugated aluminum, which will permit a liquid to pass axially of the coil between the webs. 4 figures. E.G.S.

MACHINERY—GUIDE ROLLS

FIFE, IRWIN L. Automatic web guiding apparatus. U. S. patent 2,562,026. Filed June 7, 1946. Issued July 24, 1951. 6 claims. [Cl. 242-76]

A web-guiding apparatus is designed to compensate for any lateral deviation of a traveling web (e.g., paper, cellophane, cloth, or the like) by controlling its path of travel through accurate alignment of the edges. The device includes a shaft which is actuated by a vacuum mechanism to rotate in either of two directions in order to shift the moving web. 5 figures. E.G.S.

MACHINERY—HEAD BOX

HORNBOSTEL, LLOYD. Flow evener. U. S. patent 2,566,450. Filed June 26, 1946. Issued Sept. 4, 1951. 5 claims. Assigned to Beloit Iron Works. [Cl. 92-44]

A flow evener for a stock inlet is equipped with a rectifier roll which converts crossflow velocity into the desired exit velocity. This corresponds to Canadian patent 448,409; *cf.* B.I.P.C. 18: 726. E.G.S.

HORNBOSTEL, LLOYD. Rectifier roll. U. S. patent 2,566,449. Filed June 26, 1946. Issued Sept. 4, 1951. 9 claims. Assigned to Beloit Iron Works. [Cl. 92-44]

A rectifier roll for the stock inlet of a Fourdrinier machine incorporates a perforated tube which receives stock from the inlet, and a number of spaced parallel baffles which direct the stock transversely through the tube, thereby eliminating crossflow effects. This corresponds to Canadian patent 448,408; *cf.* B.I.P.C. 18: 727. E.G.S.

LOWE, ALLEN A. Papermaking apparatus. U. S. patent 2,563,790. Filed April 14, 1948. Issued Aug. 7, 1951. 1 claim. Assigned to Sandy Hill Iron & Brass Works. [Cl. 92-44]

A flowbox construction includes a number of separate sections which are arranged in such a manner that an inlet and several interconnected discharge orifices are provided. This corresponds to Canadian patent 470,576; *cf.* B.I.P.C. 21: 438. E.G.S.

MACHINERY—JORDANS

STUCK, HAROLD D. Self-expanding separators for jordan engines. Canadian patent 475,122. Filed Feb. 27, 1947. Issued July 10, 1951. 23 claims. Assigned to John W. Bolton & Sons, Inc.

A separating member between the knives of a jordan plug or shell is prepared from a phenol-formaldehyde resin (e.g., Haveg) with a silica or asbestos filler, sulfuric acid, and a comminuted ferrous material with which the acid can react to release hydrogen gas. 5 figures. E.G.S.

MACHINERY—PACKAGING MACHINERY

CLARKE, HAROLD E. Roll wrapping machine. U. S. patent 2,564,594. Filed Sept. 13, 1949. Issued Aug. 14, 1951. 2 claims. Assigned to Canadian International Paper Company. [Cl. 93-2]

A wrapping machine is designed for the application of one or more convolutely wound layers of wrapping paper around a large roll of newsprint. Means are included for withdrawing paper from a supply roll and feeding it to a wrapping station of the machine. 4 figures. E.G.S.

FRANCO, SALVATORE A. Straw packaging machine. U. S. patent 2,563,404. Filed Sept. 26, 1947. Issued Aug. 7, 1951. 3 claims. Assigned to Diamond Straw & Machine Corporation. [Cl. 93-3]

A machine for the packaging of drinking straws includes means for sliding the straws into individual tubular paper wrappers. This corresponds to Canadian patent 463,837; *cf.* B.I.P.C. 20: 612. E.G.S.

HOHL, GEORGE I., RIST, JOHN M., WEISE, FREDERICK H., and RIST, GOTTLIEB A. Label bearing wrapping material and mechanism for applying the same to articles or assemblies of articles. Canadian patent 475,003. Filed July 2, 1949. Issued July 3, 1951. 5 claims. Assigned to Processing Equipment Corporation.

A label-bearing wrapping material is provided in the form of a continuous preprinted web which is adapted to be drawn from a roll of the material; the web incorporates preformed indented notches along its edges which are designed to co-operate with wrapper-material delivery and con-

trol means. A wrapping mechanism is also provided for use in conjunction with the wrapping material. 5 figures. E.G.S.

KULPINSKI, LEO. Apparatus with movably mounted spoon magazine for inserting spoons in cartons. U. S. patent 2,563,728. Filed Jan. 17, 1949. Issued Aug. 7, 1951. 4 claims. Assigned to Marathon Corporation. [Cl. 226-2]

An apparatus comprises means for conveying a series of flat, collapsed cartons (e.g., ice cream cartons) which incorporate pocket portions to a spoon-inserting station where means are provided for feeding one spoon at a time from a magazine and for inserting the spoon in the pocket portion of the carton. 3 figures. E.G.S.

LOCKE, JEWELL G. Machine for manufacturing and assembling filler partitions. U. S. patent 2,563,947. Filed Aug. 28, 1946. Issued Aug. 14, 1951. 6 claims. Assigned to Anchor Hocking Glass Corporation. [Cl. 164-60; changed to 164-61]

A machine is adapted for the manufacture and assembly of corrugated board partitions into filler units for shipping cartons (e.g., for glass articles). 29 figures. E.G.S.

WATERS, HARRY F. Machine for forming, packing, and sealing containers. U. S. patent 2,565,444. Filed July 9, 1949. Issued Aug. 21, 1951. 15 claims. [Cl. 93-3]

A machine is adapted for the manufacture of a number of side-by-side continuous rows of joined envelope containers from one or more continuous paper webs. Means are included for inserting a foodstuff into the envelopes and subsequently heat sealing the filled packages. 12 figures. E.G.S.

MACHINERY—PASTING MACHINE

STOEVER, HENRY V. H., JR. Spot glue applicator for carton making machines. U. S. patent 2,559,175. Filed Dec. 3, 1948. Issued July 3, 1951. 9 claims. Assigned to The American Tobacco Company. [Cl. 91-50]

A high-speed, adhesive-applying mechanism includes a pair of rolls which rotate above and below the space over which the portion of the carton to be glued is fed. Each roll incorporates a segment of larger diameter than the rest of the roll, and the rotation of the rolls is timed to bring the segments into register as the carton passes between them. The upper roll, which is the adhesive-applying roll, is arranged adjacent to a train of adhesive-transfer rolls. The segment on the upper roll is, at one point in its revolution, tangent to the last of the transfer rolls, and a layer of adhesive is applied to the surface of the segment as it engages the surface of the transfer roll. Upon further revolution, as the carton passes between the registering segments of the upper and lower rolls, the adhesive is applied to the desired portion of the carton blank. 6 figures. E.G.S.

YONKERS, CHARLES H. Solenoid controlled taping machine. U. S. patent 2,564,901. Filed Nov. 20, 1947. Issued Aug. 21, 1951. 10 claims. Assigned to S&S Corrugated Paper Machinery Co., Inc. [Cl. 216-22]

A solenoid-controlled box-taping machine incorporates electromechanical

means for applying the tape and cutting it off at the proper point as the folded box moves through the machine. 5 figures. E.G.S.

MACHINERY—REFINERS

ARPIN, EDMUND P., JR. Rotary refiner. U. S. patent 2,566,869. Filed Feb. 25, 1948. Issued Sept. 4, 1951. 9 claims. [Cl. 92-26]

A rotary refiner incorporates a number of rotor stones which are resiliently secured in a backing plate which is pivotally mounted in a housing attached to the rotating shaft of the refiner. The resilient mounting exerts a constant compressive force against the stone through a pressure pad which extends between the mounting and the stone across the width of the stone. The possibility of fracture of the stone during operation is reduced by the resilient mounting and pressure distribution features. 5 figures. E.G.S.

MACHINERY—ROLLS

HORNBOSTEL, LLOYD. Diaphragm construction. U. S. patent 2,564,693. Filed Aug. 20, 1947. Issued Aug. 21, 1951. 4 claims. Assigned to Beloit Iron Works. [Cl. 137-157]

A flexible rubber diaphragm which is adapted for use in fluid-actuated diaphragm units for the loading of press rolls is reinforced with radially extending fibrous cords which are embedded in the structure. 4 figures. E.G.S.

MACHINERY—SHEET-FEEDING MECHANISM

KOOLE, PIETER, BOURGONJON, LOUIS R., and DE LANGE, HENDRIK. Devices for conveying paper and similar substances. Canadian patent 475,924. Filed Nov. 27, 1947. Issued Aug. 7, 1951. 5 claims. Assigned to N. V. Philips' Gloeilampenfabrieken.

A rubber-belt conveyor which is adapted for use in conjunction with paper-sorting machines, printing presses, and the like incorporates an electrostatic device for holding loose sheets of paper on the belt. 3 figures. E.G.S.

MACHINERY—SLICE

MALKIN, BERNARD A. Slice assemblies for paper making machines. Canadian patent 475,144. Filed Sept. 29, 1948. Issued July 10, 1951. 20 claims. Assigned to Dominion Engineering Works Limited.

A slice plate is secured to the lower portion of a slice-plate carrier which is arranged between and adjustably supported by the pond plates of the slice. The upper portion of the carrier is supported from the pond plates by means which can be adjusted to raise and lower the carrier and which are designed to provide a pivotal axis about which the carrier can be swung to shift the slice plate to different positions of adjustment along the Fourdrinier wire. The lower portion of the carrier is also supported from the pond plates by means which can be adjusted to swing the carrier about the aforementioned pivotal axis. 8 figures. E.G.S.

MACHINERY—SLITTERS AND WINDERS

REBUT, JACQUES A. L., and CHERIGIÉ, PIERRE. Constant tension drive for web reels. U. S. patent 2,563,660. Filed Jan. 4, 1950.

Issued Aug. 7, 1951. 4 claims. Assigned to La Cellophane. [Cl. 242-75]

A winder for webs of fragile material (e.g., regenerated cellulose) embodies a positive variable-speed drive for the takeup reel which is designed to maintain a constant web speed, regardless of the diameter of the winding. The reel speed is further modified as necessary to maintain a constant web tension. 1 figure. E.G.S.

ZISKA, ADAM. Apparatus for making slitted and expanded sheet material. U. S. patent 2,565,641. Filed Aug. 21, 1946. Issued Aug. 28, 1951. 13 claims. Assigned to Research Products Corporation. [Cl. 164-6.5]

An apparatus is adapted for the slitting of thin, flexible sheet material, such as paper, cloth, metal foil, or the like, which, after being slit, is adapted to be expanded by a stretching operation. 8 figures. E.G.S.

MACHINERY—STRIPPING MACHINE

HEDSTROM, ERIC L., OTTO, MARTIN C., and GOODERHAM, CECIL E. Machines for removing waste from die-cut articles. Canadian patent 474,872. Filed May 1, 1947. Issued July 3, 1951. 12 claims.

A machine which is designed for the stripping of waste from die-cut box blanks can be adjusted to accommodate boxes of various sizes and shapes. 12 figures. E.G.S.

HEDSTROM, ERIC L., OTTO, MARTIN C., and GOODERHAM, CECIL E. Machines for removing waste from die-cut articles. Canadian patent 474,873. Filed May 1, 1947. Issued July 3, 1951. 8 claims.

An apparatus is adapted for the stripping of waste from the die-cut portions of a sheet of paper stock after it has been passed through a cutting and creasing machine. This is the same as U. S. patent 2,548,370; *cf.* B.I.P.C. 21: 670. E.G.S.

MOLDED PULP ARTICLES

SCHILLING, RUTH M. Egg cartons. Canadian patent 475,544. Filed May 11, 1948. Issued July 24, 1951. 9 claims. Assigned to Shellmar Products Company.

A molded-pulp egg carton is formed of three connected elements; two of the elements are arranged to enclose and protect the egg from damage during handling or shipment, and the third element is designed to fold over the other two to form a top closure. 11 figures. E.G.S.

SHEPARD, ERNEST L. Packing for fragile articles. U. S. patent 2,564,729. Filed Sept. 23, 1946. Issued Aug. 21, 1951. 23 claims. Assigned to The Canal National Bank of Portland and William B. Nulty. [Cl. 206-65]

A molded-pulp packing unit is designed for the shipment of elongated fragile articles, such as fluorescent lamps. This corresponds to Canadian patent 453,215; *cf.* B.I.P.C. 19: 370-1. E.G.S.

PACKAGING

MAYER, CARL G., and SEIFERTH, OSCAR E. Sliced bacon package. U. S. patent 2,565,976. Filed Jan. 7, 1950. Issued Aug. 28, 1951. 11 claims. Assigned to Oscar Mayer & Co., Inc. [Cl. 99-174]

A predetermined quantity of sliced bacon is arranged in overlapped relation on a paperboard backing which incorporates adjoining side and end flaps that extend over adjacent margins of the package, and the entire assembly is enclosed in a transparent overwrap. 4 figures. E.G.S.

MORRELL, JACQUE C. Cosmetic package. U. S. patent 2,561,400. Filed April 15, 1946. Issued July 24, 1951. 2 claims. [Cl. 132-79]

A compact cosmetic package consists of a cardboard base which incorporates open cells designed to hold the cosmetics; an oil-resistant sheet of waxed paper, regenerated cellulose, or the like, which covers the open cells and the top surfaces of the base; and several sheets of facial tissue which overlie the oil-resistant sheet. 6 figures. E.G.S.

PAPER—COATED

MULLOY, LORNE B., and THOMPSON, ROBERT H. Apparatus for controlling the thickness of a coating on a traveling web. U. S. patent 2,558,773. Filed March 6, 1948. Issued July 3, 1951. 4 claims. Assigned to The Haloid Company. [Cl. 91-10]

A roll-coating apparatus which is designed for the coating of photographic papers includes a doctor roll which has a hard, polished surface and which is mounted opposite the coating roll, means for driving the doctor roll at varying speeds in relation to the speed of travel of the web to regulate the thickness of the coating, and a flexible, resilient scraper (e.g., gum rubber, nylon, leather, neoprene, or the like) which extends across the periphery of the doctor roll in advance of its point of contact with the coating. 5 figures. E.G.S.

O'CONNOR, JAMES J., SAVAGE, RUSSELL H., and SCHWALBE, HELLMUTH C. Method of and apparatus for coating paper. U. S. patent 2,565,260. Filed April 28, 1947. Issued Aug. 21, 1951. 14 claims. Assigned to The Mead Corporation. [Cl. 117-111]

A roll-coating machine is designed for use in the manufacture of a mineral-finished book paper which is suitable for high-grade multicolor reproduction and halftone magazine illustration work. 8 figures. E.G.S.

PINKNEY, PAUL S. Ethylene/vinyl alcohol/acrylic acid copolymers, their ammonium salts, and paper coated therewith. U. S. patent 2,566,244. Filed Nov. 10, 1949. Issued Aug. 28, 1951. 4 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 117-155]

A binder for a paper-coating pigment (e.g., clay) comprises the ammonium salt of an ethylene-vinyl alcohol-acrylic acid copolymer which has a molecular weight of at least 50,000, and which contains in combined form 25-60% of ethylene, 10-30% of vinyl alcohol, and 25-60% of acrylic acid (all by weight). 1 figure. E.G.S.

PAPER—FILLERS

SAFFORD, MOYER M. Water-repellent paper. Canadian patent

475,819. Filed April 6, 1945. Issued Aug. 7, 1951. 3 claims. Assigned to Canadian General Electric Company, Limited.

A water-repellent paper is produced by the addition of a treated filler composition to the stock prior to beating; the additive comprises a finely divided inorganic clay filler, the particles of which are coated with a thin water-repellent film of an organopolysiloxane, and ethyl alcohol. This is the same as U. S. patent 2,510,661; *cf.* B.I.P.C. 20: 835. E.G.S.

PAPER—OPACITY

HURLEY, ALBERT B. Means for increasing the opacity of sheets or webs of paper, or the like. U. S. patent 2,563,117. Filed Nov. 5, 1947. Issued Aug. 7, 1951. 7 claims. Assigned to North American Paper Process Company, Inc. [Cl. 101-248]

A control device actuated by a photoelectric cell serves to maintain coated grids or screens on opposite sides of a paper web in such relative positions that the resultant combined coverage will remain substantially 100% in the case of 50/50 grids or screens with a commensurate increase in the opacity of the treated web. The process is designed for the reduction of show-through in newsprint or magazine paper which contains bleached pulp. 6 figures. E.G.S.

PAPER SPECIALTIES

AMBERG, WALTER E. Method of forming rounded bottom conical paper cups. U. S. patent 2,563,633. Filed May 25, 1949. Issued Aug. 7, 1951. 3 claims. Assigned to Lily-Tulip Cup Corporation. [Cl. 93-36.2]

A method is described for the formation of a round-bottom paper cup without the creation of irregularly formed masses of paper or the weakening of the bottom portion of the cup. 19 figures. E.G.S.

BERRY, BURTT L. Reproduction surfaces. Canadian patent 475,765. Filed June 9, 1949. Issued Aug. 7, 1951. 9 claims.

A paper base for graphic art reproduction work incorporates the capacity to fluoresce when excited or activated by a substantially invisible light (e.g., near ultraviolet) to emit actinic light, or when excited by any other source which has an energy level different in wavelength from that produced by fluorescence. About 7-20 grams of a colorless fluorescent dye (e.g., anthracene, β-naphthol, disulfonic acid, phenanthrene, or methylumbelliferone) per gallon of stock is added at the beater in the manufacture of the paper. E.G.S.

BONINI, JOHN H. Laminated sheet material for packaging moisture-containing foods. U. S. patent 2,559,109. Filed March 15, 1946. Issued July 3, 1951. 5 claims. Assigned to Marathon Corporation. [Cl. 154-50]

A laminated sheet material which is adapted for the packaging of smoked ham, bacon, frozen foods, and the like comprises an inner layer of glassine, an intermediate multi-ply layer of creped tissue or wadding, and an outer layer of vegetable parchment, greaseproof, or the like. A suitable water-permeable starch or glue adhesive is used between the inner and intermediate plies, and a wax adhesive composition is incorporated between the intermediate and outer plies. 3 figures. E.G.S.

BRADY, CHARLES V., and OTTINGER, AUGUST F. Valved bag and its manufacture. U. S. patent 2,564,462. Filed Jan. 17, 1949. Issued Aug. 14, 1951. 5 claims. Assigned to Bemis Bro. Bag Company. [Cl. 150-9]

A fabric valve bag incorporates a stiff paper reinforcing tongue which is adhesively secured along the upper margin of the bag. 9 figures. E.G.S.

BRANDL, ROBERT J. Disposable diaper. U. S. patent 2,564,094. Filed May 6, 1946. Issued Aug. 14, 1951. 3 claims. [Cl. 128-284]

A disposable laminated paper diaper comprises an inner layer or layers of soft, absorbent paper and an outer layer of relatively moisture-resistant paper. 5 figures. E.G.S.

BRUCE, DONALD S. Method for making reinforced laminated material. U. S. patent 2,561,781. Filed April 21, 1950. Issued July 24, 1951. 10 claims. Assigned to Gummed Products Company. [Cl. 154-93]

A laminated gummed paper tape is reinforced by threads or cords which are incorporated at spaced intervals or in serpentine fashion between the layers of the laminate. 7 figures. E.G.S.

CASNATI, LOLA A. Sanitary holder for articles. U. S. patent 2,561,842. Filed July 23, 1948. Issued July 24, 1951. 1 claim. [Cl. 294-25]

A sanitary paper holder incorporates integrally formed ribs which form fingerlike projections that are adapted for gripping articles to be picked up, such as wads of cotton and the like. 11 figures. E.G.S.

COGGINS, GEORGE F., and AHEARN, JOHN F. Art of dielectrics. Canadian patent 474,902. Filed Oct. 31, 1942. Issued July 3, 1951. 6 claims. Assigned to Aerovox Corporation.

A dielectric sheet material comprises an absorbent paper which has been impregnated with glycerol triricinoleate containing less than 0.4% of free fatty acid (calculated as oleic acid) as an impurity. The ricinoleate has a specific resistivity greater than 3×10^{11} ohms/cc. at 185°F. and a power factor less than 0.1% at 185°. It is claimed that the impregnated sheet is characterized by improved insulation resistance, power factor, and life when incorporated in a capacitor. 4 figures. E.G.S.

CROSS, BERT S. Printing accessories. Canadian patent 475,517. Filed April 10, 1944. Issued July 24, 1951. 8 claims. Assigned to Minnesota Mining & Manufacturing Company.

A tympan sheet or blanket for use on a tympan roll to prevent offset in printing comprises a backing of 130-pound paper which is adhesively coated with a uniform layer of glass beads about 0.003 inch in diameter. 3 figures. E.G.S.

CROSS, BERT S. Printing accessories. Canadian patent 475,518. Filed July 26, 1947. Issued July 24, 1951. 7 claims. Assigned to Minnesota Mining & Manufacturing Company.

A tympan sheet or printing blanket which is adapted for use in the prevention of offset comprises a paper backing about 0.004-0.16 inch thick; a uniform coating of generally spherical glass beads about 0.001-0.005 inch in diameter; and a glue coating of less average thickness than the diameter of the beads, which serves to bond the beads to the backing. 8 figures. E.G.S.

DAVIS, AUSTIN E., and PERRY, LLOYD M. Materials suitable for decoration by stamping. Canadian patent 475,376. Filed Aug. 20, 1947. Issued July 17, 1951. 10 claims. Assigned to Nashua Gummed and Coated Paper Company.

A wax-coated paper sheet is adapted to be stamped with a heated die or embossing roll to provide two-tone effects with a clearly defined impressed design and a pronounced color contrast. 4 figures. E.G.S.

DAVIS, LEWIS. Decalcomania paper. U. S. patent 2,561,976. Filed Oct. 9, 1947. Issued July 24, 1951. 3 claims. Assigned to McLaurin-Jones Co. [Cl. 117-3.6]

A normally dry, nontacky adhesive coating composition which is suitable for application to decalcomania paper is prepared with the following ingredients: 1-13 parts of animal or fish glue, 17-32.5 parts of dextrin, 40-70 parts of water, 0.1-0.2 part of fixed alkali, and 5-50 parts of natural or synthetic latex (50% solids). E.G.S.

DE SYLVA, OSCAR J. Article of manufacture and method. U. S. patent 2,563,316. Filed Nov. 9, 1945. Issued Aug. 7, 1951. 4 claims. Assigned to Shellmar Products Corporation. [Cl. 206-46]

The walls of a heat-sealable bag comprise inner liners of saran sheeting which are laminated to outer sheets of paper or cloth. The laminating adhesive has the following composition: 40% polymerized vegetable oil, 10% chlorinated rubber, 40% toluene, and 10% methyl ethyl ketone. 5 figures. E.G.S.

FINNO, JAMES. Lithographic printing plate. U. S. patent 2,561,353. Filed Feb. 3, 1947. Issued July 24, 1951. 7 claims. [Cl. 101-149.2]

A planographic printing plate comprises an unbacked, single-ply, unsized sheet of uncalendered amyloid parchment paper which has a minutely fibrous, fine-grain surface whose Bekk smoothness is less than 25 seconds, and whose gloss is approximately 25%, as measured by an Ingersoll Glarimeter. The nonimage area of the plate is coated with an aqueous ink-repellent dampening solution which contains glycerin, sodium sulfate, boric acid, and gum acacia; the solution produces a nonpenetrating, nonsaturating film on the plate, thus preventing the stretching, wrinkling, or tearing of the sheet. E.G.S.

FROST, FREDERICK H. Paper base planographic printing plates. Canadian patent 475,216. Filed Aug. 14, 1947. Issued July 10, 1951. 15 claims. Assigned to S. D. Warren Company.

A planographic printing plate comprises a paper base and a base coating which consists essentially of a hydrophilic colloid (e.g., casein) and a pigment or filler (e.g., clay); the coating is preferably rendered more or less insoluble by treatment with a colloid-hardening agent (e.g., formaldehyde)

and application of a light wash coat of a hydrophilic colloid which is free of pigment. This is the same as U. S. patent 2,534,588; *cf.* B.I.P.C. 21:369.
E.G.S.

FROST, FREDERICK H. Planographic printing plates and treatment thereof. Canadian patent 475,219. Filed Oct. 27, 1948. Issued July 10, 1951. 5 claims. Assigned to S. D. Warren Company.

A process is described for the production of a planographic printing plate which has a hydrophilic printing surface. As an example, a wet-strength paper body stock is coated on both sides with about five pounds (dry weight) per 1000 sq. ft. of a coating which contains 100 parts of clay, 18 parts of casein dispersed in ammonia, and 1.5 parts of dimethylolurea, and dried. The base-coated sheet is washed on one side with an aqueous mixture which contains 0.2% of guar gum, 15% of zinc acetate, and 1% of formaldehyde. The treated sheet is dried, calendered, brushed, and typed upon with a typewriter. The typed sheet is swabbed with a cotton pad which has been wetted with a 3% aqueous solution of monoammonium phosphate. When the treated sheet is run as a plate on an offset duplicator, it holds a water film on its unimaged surface and remains free from scum during the useful life of the plate. E.G.S.

GREINER, CHARLES J., and THOMPSON, OSCAR T. Method and apparatus for making tampons. U. S. patent 2,566,190. Filed Oct. 26, 1945. Issued Aug. 28, 1951. 22 claims. Assigned to International Cellucotton Products Company. [Cl. 19-144; changed to 19-144.5]

The compressed creped tissue paper core of a catamenial tampon is provided with a surface covering of cotton fibers, which is enclosed in a knitted tubular jacket. This is the same as Canadian patent 472,963; *cf.* B.I.P.C. 21:755. E.G.S.

GROUSE, RICHARD A. Manufacture of metallized paper electrical capacitors. Canadian patent 475,509. Filed Jan. 8, 1948. Issued July 24, 1951. 3 claims. Assigned to A. H. Hunt Limited.

An electrical capacitor comprises several metallized (e.g., with aluminum) paper strips which are wound together into a roll with their edges flush; a layer of molten copper is sprayed onto each end of the roll. 2 figures.
E.G.S.

GUNNAR, BENEDICT B. Tea bag. U. S. patent 2,562,456. Filed July 9, 1949. Issued July 31, 1951. 2 claims. [Cl. 99-77.1]

A cellophane holding strip which is stapled to one edge of a filter paper tea bag is used to compress the bag against the bowl of a spoon. 3 figures.
E.G.S.

HAMPSON, HERBERT, and QUINN, PAUL. Flexible veneer and process for making same. U. S. patent 2,563,111. Filed Sept. 2, 1950. Issued Aug. 7, 1951. 9 claims. Assigned to General Coated Products, Inc. [Cl. 154-121]

A flexible laminated product is adapted for use as a veneer or as a decorative surface coating for walls, tables, desks, counters, doors, partitions, and the like. As an example, a thin overlay sheet of a transparent rayon base or high-alpha cellulose paper (about 0.003-0.008 inch thick) which is impregnated with 50-75% by weight of a heat-set resin of the group consisting

of melamine-aldehyde and diallyl phthalate resins is laminated to a relatively thick backing sheet of saturating paper (0.020-0.050 inch thick) which is impregnated with 20-30% by weight of a cured rubbery polymerizate of the group consisting of 2-chloro-1,3-butadiene polymers, butadiene-styrene copolymers, and natural rubber. 2 figures. E.G.S.

HELDMANN, HENRY J. Adhesive bandages. Canadian patent 474,930. Filed July 14, 1948. Issued July 3, 1951. 7 claims. Assigned to Cress Laboratories.

A transparent, pressure-sensitive adhesive bandage incorporates an aluminum-coated paper covering strip which overlies the adhesive surface of the bandage. This corresponds to U. S. patent 2,544,315; *cf.* B.I.P.C. 21:600. E.G.S.

HOOD, STEWART. Bottle capsule. U. S. patent 2,562,423. Filed Jan. 28, 1949. Issued July 31, 1951. 1 claim. Assigned to The Montreal Lithographing Company Limited. [Cl. 93-39.1]

A paper capsule which is adapted for use on the top of a whiskey bottle is coated with a layer of nontacky material (e.g., commercial ink, varnish, or the like) which completely covers the adhesively coated inner surface of that portion of the finished capsule which lies above a line of weakening perforations and is exposed to contact with the neck of the bottle. The coating serves to prevent adhesion between the bottle neck and that portion of the capsule which lies above the line of perforations. 6 figures. E.G.S.

HUTT, JOHN W. Moisture-vapor-proof pouches. Canadian patent 475,648. Filed Nov. 7, 1946. Issued July 31, 1951. 2 claims. Assigned to Canada Foils Limited; U. S. patent 2,565,026. Filed Nov. 4, 1946. Issued Aug. 21, 1951. 2 claims. [Cl. 229-53]

A heat-sealed tobacco pouch incorporates a bellows-type construction which is formed by the arrangement of folding gussets along the meeting edges, which can be spread open to permit ready access to the pouch. 21 figures. E.G.S.

KARLSON, KARL R., and PETERSON, CLIFFORD E. Manufacture of glassine paper. U. S. patent 2,566,130. Filed June 10, 1944. Issued Aug. 28, 1951. 5 claims. Assigned to Riegel Paper Corporation. [Cl. 92-3; changed to 92-20]

A method for the production of greaseproof and glassine papers comprises the steps of subjecting bleached neutral sulfite semichemical pulp from broadleaf, short-fiber woods which is substantially free from lignin and has a high hemicellulose content (i.e., more than 10%) to mechanical refining and hydration at a pH of 6-9; separately subjecting long-fiber sulfite pulp to mechanical hydration and refining with the addition of alum; washing the resultant pulp to remove the alum and to provide an approximately neutral pulp; admixing the resulting refined, hydrated pulp with the bleached neutral sulfite semichemical pulp to obtain a mixed pulp with a pH of 6-9; and forming a paper web from the pulp mixture. E.G.S.

LANG, MAXWELL E. Collapsible sanitary lining for washbowls. U. S. patent 2,563,945. Filed April 9, 1946. Issued Aug. 14, 1951. 1 claim. [Cl. 229-1.5]

A self-supporting washbowl liner is die formed from a spherical or elliptospherical blank of glassine or cellophane. 12 figures. E.G.S.

MALMSTROM, HOMER E. Plywood panel. U. S. patent 2,565,251. Filed April 30, 1948. Issued Aug. 21, 1951. 4 claims. Assigned to Paper Patents Company. [Cl. 154-45.9]

A Douglas-fir plywood panel incorporates a plastic surfacing which comprises at least one sheet of a resin-impregnated paper containing 35-60% by weight of phenol-, melamine-, or urea-aldehyde resin. 4 figures. E.G.S.

MAYFIELD, PAUL. Processes for making paper having insecticidal properties and products resulting therefrom. U. S. patent 2,566,092. Filed Dec. 7, 1946. Issued Aug. 28, 1951. 7 claims. Assigned to Hercules Powder Company. [Cl. 117-154]

A kraft paper is rendered toxic to insects by the incorporation of a polychlorocamphene which contains 60-72% chlorine; the amount of camphene present constitutes at least 1% by weight of the paper. E.G.S.

MILLIDGE, BRYDONE D. Paper tubing and bags. Canadian patent 475,315. Filed Sept. 22, 1948. Issued July 17, 1951. 3 claims. Assigned to Bonar & Bemis Ltd.

A flexible crinkled-paper bag is constructed with the grain direction of its walls lying at an angle of 10-30° with its transverse axis. 2 figures. E.G.S.

MORSE, MALCOLM W. Insulated cup. U. S. patent 2,563,352. Filed April 5, 1946. Issued Aug. 7, 1951. 3 claims. [Cl. 229-14]

A frustoconical paper food container is provided at its upper and lower portions with circumferential ribs, so that when two similar containers are nested, an insulating chamber is formed between the side walls of the receptacles. A number of bosses which are incorporated in the side walls of the container between the ribs serve to prevent the contraction of the insulating chamber. 7 figures. E.G.S.

MORTON, JOHN L., and GEORGE, HARRY O. Laminated dry stencil. U. S. patent 2,562,676. Filed Jan. 6, 1948. Issued July 31, 1951. 1 claim. Assigned to International Business Machines Corporation. [Cl. 101-128.2]

A laminated dry stencil which is suitable for use in duplicating or check-writing machines is prepared by pressing together a dry-process stencil which has been prepared for ordinary use and a sheet of capacitor tissue, while subjecting the laminated sheets to low temperature and pressure. Heat sealing may be accomplished in this manner at various temperatures, depending upon the softening point of the material with which the previously prepared dry-process stencil is coated, which is usually below 210°F. The capacitor tissue is applied to the most heavily coated side of the porous base sheet, and the required pressure may be applied by the use of heated platens or calender rolls. 6 figures. E.G.S.

NETHERLY, GEORGE P., CROSS, BERT S., and ANDERSON, GILBERT R. Abrasive articles. Canadian patent 474,432. Filed Sept.

11, 1950. Issued June 12, 1951. 5 claims. Assigned to Minnesota Mining & Manufacturing Company.

Abrasive particles are bonded to a sandpaper backing with an adhesive composition which includes *n*-propyl methacrylate. E.G.S.

NETHERLY, GEORGE P., CROSS, BERT S., and ANDERSON, GILBERT R. Abrasive articles and methods of making the same. Canadian patent 474,431. Filed July 16, 1941. Issued June 12, 1951. 18 claims. Assigned to Minnesota Mining & Manufacturing Company.

A process is described for the manufacture of sandpaper, emery cloth, and the like. As an example, a glue-resin adhesive is coated on a cloth or paper backing as a primary coat; the adhesive consists of 74 parts of glue, 82 parts of phenol-aldehyde resin, 66 parts of water, 13 parts of urea, 24 parts of concentrated ammonia, and 16 parts of Cellosolve. Abrasive granules are oriented or coated onto the adhesive and allowed to dry at room temperature for about 20 minutes. The dried sheet is coated with a resin solution which consists of 60 parts of phenol-aldehyde resin and 40 parts of Cellosolve and which forms a second anchoring adhesive. E.G.S.

PIAZZE, THOMAS E. Tobacco pouch and method of making same. U. S. patent 2,558,780. Filed Aug. 11, 1945. Issued July 3, 1951. 14 claims. Assigned to Shellmar Products Corporation. [Cl. 229-80]

The blank for a hermetically sealed, siftproof tobacco pouch comprises a layer of heat-sealable material (e.g., Pliofilm or cellophane) laminated to a glassine web by means of a microcrystalline wax. 20 figures. E.G.S.

WINESETT, FRANKLIN P. Methods of making shopping bags. Canadian patent 475,798. Filed March 15, 1949. Issued Aug. 7, 1951. 4 claims.

A paper shopping bag is provided with a folded top and with handles, the ends of which are secured to and covered by the bag. This is the same as U. S. patent 2,469,536; *cf.* B.I.P.C. 19:747. E.G.S.

WORTHEN, STEPHEN V. Singly coated planographic printing plates and methods of making same. Canadian patent 475,218. Filed Sept. 27, 1947. Issued July 10, 1951. 12 claims. Assigned to S. D. Warren Company.

A method is described for the manufacture of paper-base planographic printing plates. As an example, a sheet of wet-strength paper is coated on one side with a composition which contains 100 parts of clay and 18 parts of casein dissolved in ammonia. About 15 pounds (dry weight) of coating is applied per ream (25 × 38—500). The coating is dried and calendered and then washed with a strongly ammoniacal solution to which 16% by weight of zinc chloride has been added. The sheet is dried and used as an offset plate. One thousand prints can be made from the plate without objectionable wet-through, and the printing quality is good. E.G.S.

PHYSICAL TESTING—PAPER—BURSTING STRENGTH

GETCHELL, RAYMOND E. Manually operated hydraulic clamping

means for testing machines. U. S. patent 2,563,833. Filed Jan. 24, 1949. Issued Aug. 14, 1951. 5 claims. Assigned to B. F. Perkins & Son, Inc. [Cl. 73-102]

A bursting strength tester includes means for the application of a predetermined clamping pressure to a paper specimen and for the release of such pressure. 3 figures. E.G.S.

PLASTICS—PAPER-BASE

NOVAK, IZADOR J. Fibre base plastic compositions. Canadian patent 475,134. Filed Aug. 25, 1950. Issued July 10, 1951. 6 claims. Assigned to The Canadian Raybestos Company, Ltd.

A paper web is impregnated with a urea- or melamine-formaldehyde resin and subjected to a heat treatment to produce a sheet material which can be heat molded and laminated at low pressure. This is the same as U. S. patent 2,525,310; *cf.* B.I.P.C. 21:218. E.G.S.

WACHTER, JOSEPH J., and STRAKA, CYRIL J. Process of impregnating a fibrous sheet with a phenolic resin. U. S. patent 2,565,152. Filed Oct. 30, 1946. Issued Aug. 21, 1951. 5 claims. [Cl. 117-65]

Fibrous sheet materials (e.g., cloth, paper, or the like) which have been impregnated with a thermosetting phenol-aldehyde resin varnish are treated with steam in order to expedite the conversion of the resin to the intermediate or B stage and to improve the physical properties of the ultimate laminate produced from the material. In addition, about 0.1-2% (based on the weight of the resin) of an inorganic base (e.g., sodium hydroxide) or a primary aliphatic amine (e.g., ethylenediamine) is incorporated in the varnish as a catalyst to reduce the time required for the treatment further and curing of the sheet material. 1 figure. E.G.S.

WILSON, LUCIUS H., LANDES, CHESTER G., and MAXWELL, CHARLES S. Sizing cellulosic fibers with cationic melamine resin and hydrophobic material. U. S. patent 2,563,897. Filed July 13, 1945. Issued Aug. 14, 1951. 10 claims. Assigned to American Cyanamid Company. [Cl. 92-21]

A method is adapted for the production of a felted fibrous cellulosic material which contains large quantities (50-100% by weight) of a resinous impregnating agent (e.g., polystyrene). This corresponds to Canadian patent 450,523; *cf.* B.I.P.C. 19:68. E.G.S.

PURIFIED WOOD FIBER

MARTIN, MERVIN E., and SHERK, DANIEL L. Treatment of wood. Canadian patent 474,507. Filed July 26, 1948. Issued June 12, 1951. 8 claims. Assigned to Camille Dreyfus.

A process for the preparation of purified wood pulp cellulose which is suitable for use in the production of cellulose derivatives (e.g., organic acid esters of cellulose or cellulose ethers) comprises the digestion of wood chips (e.g., white birch) for 5-60 minutes at 150-160°C. with a 50-70% aqueous acetic acid solution which contains 0.5-1.0% (based on the weight of the wood) of phosphoric acid; recovery of the digested wood; and subjection of the wood to at least one additional digestion for 5-60 minutes at 150-160° with 6-8 parts (based on the weight of the wood) of a 30-40% aqueous

acetic acid solution which contains 0.5-1.0% (based on the weight of the wood) of phosphoric acid. E.G.S.

ROOFING FELTS

KALIN, JOHN B. Method of making asphalt covering units. U. S. patent 2,559,879. Filed Jan. 31, 1945. Issued July 10, 1951. 7 claims. Assigned to Johns-Manville Corporation. [Cl. 117-9; changed to 117-5]

A felted asphalt shingle (e.g., asbestos or rag felt base) has a thick butt appearance, but no sharp line of demarcation occurs between the butt and the headlap areas; the thicker butt portion tapers into the headlap portion. A method is described for coating a continuous web of the material with high-melting point (i.e., about 220°F.) asphalt in a single operation. 15 figures. E.G.S.

SHIPPING CONTAINERS

BECK, HORACE W., JR., and GIBBONS, CLYDE F. Lined multiple-blank master shipping carton. U. S. patent 2,564,948. Filed Jan. 21, 1949. Issued Aug. 21, 1951. 4 claims. Assigned to Gaylord Container Corporation. [Cl. 229-14; changed to 229-23]

A heavy-duty master carton which is adapted for the shipment of a number of small packages or articles (e.g., rayon spools) comprises a tall, tubular, open-end liner of rectangular cross section and duplicate upper and lower slip covers of corresponding cross section, which fit over the open ends of the liner with their opposing ends in abutting relation. 10 figures. E.G.S.

GEORGE, WALTER C. Shipping container cover lock. U. S. patent 2,561,979. Filed May 11, 1950. Issued July 24, 1951. 9 claims. Assigned to Gaylord Container Corporation. [Cl. 229-45; changed to 229-47]

A shipping container for fruits and vegetables incorporates locking wires in the lid of the box which are adapted to be twisted around co-operating locking tabs on the side walls. 6 figures. E.G.S.

HOYLE, EGBERT P. Duplex fishing line carton. U. S. patent 2,561,699. Filed June 24, 1948. Issued July 24, 1951. 1 claim. Assigned to The Cortland Line Company, Inc. [Cl. 206-59]

A cardboard container for coils of fishing line comprises an outer sleeve and one or more drawerlike sections which are designed to fit into the sleeve. The jacket is scored in such a manner that it can be split apart to form two or more sleeve sections. 4 figures. E.G.S.

SHIPPING CONTAINERS—FROZEN FOODS

MAGILL, DONALD G., and BIGGER, RICHARD P. Frozen food container. U. S. patent 2,561,391. Filed Feb. 12, 1946. Issued July 24, 1951. 1 claim. Assigned to American Can Company. [Cl. 229-5.5]

A semirigid frozen food container comprises a tubular fibrous body and a metal end member. This corresponds to Canadian patent 453,969; *cf.* B.I.P.C. 19: 452. E.G.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

ORR, HOWARD H. Valve bag. U. S. patent 2,565,622. Filed Oct. 6, 1945. Issued Aug. 28, 1951. 4 claims. [Cl. 229-62.5]

Because a sealing string is used in sealing the junction between the bottom and the side gusset of a multiwall paper valve bag, the bottom is not sharply creased and thereby weakened during storage; the string is also used for ripping open the bag. The bag is designed for the packaging of heavy powdered or granular materials, such as cement, plaster, or the like. 11 figures. E.G.S.

SLIME PREVENTION

GILLASPIE, ATHEY G. Slime control. U. S. patent 2,564,430. Filed March 30, 1946. Issued Aug. 14, 1951. 4 claims. Assigned to The Hamilton Laboratories, Inc. [Cl. 92-21]

About one ounce of the sodium salt of mercurated benzenesulfonic acid per 6000 pounds of dry pulp is added to an aqueous suspension of unbleached kraft pulp as a slime control agent. E.G.S.

SULFITE PROCESS—AMMONIA BASE

PARRETT, ARTHUR N. Wood pulp digestion. U. S. patent 2,564,028. Filed Jan. 17, 1946. Issued Aug. 14, 1951. 3 claims. Assigned to Rayonier Incorporated. [Cl. 92-11]

A process is adapted for the production of a pulp which is suitable for use in the manufacture of cellophane. An ammonia-base sulfite cooking acid is prepared which contains at least 20% of the total spent sulfite liquor solids resulting from a preceding sulfite pulping operation. Wood chips are digested in the prepared cooking acid in accordance with conventional or desired sulfite pulping practice. The ammonia-base spent sulfite liquor is recovered at the highest possible solids content by drainage of digester-strength liquor from the digested pulp in a blowpit and by replacement of the residual liquor in the bed of pulp in the blowpit successively by weak wash water and finally by fresh water. The recovered spent sulfite liquor is concentrated in a breeching-type evaporator to a solids content of 25-70%. The concentrated liquor is sprayed into a refractory furnace and burned; the resultant gaseous combustion products are utilized to heat the evaporator. 1 figure. E.G.S.

SULFUR DIOXIDE

SOMER, VÄINÖ H. Method for recovering sulfur dioxide in liquid form. U. S. patent 2,564,452. Filed Oct. 26, 1946. Issued Aug. 14, 1951. 3 claims. Assigned one half to Aktiebolaget Kaukas Fabrik. [Cl. 62-175.5]

A method is adapted for the recovery or production of sulfur dioxide in liquid form in conjunction with the manufacture of sulfite pulp. This is similar to Canadian patent 472,863; *cf.* B.I.P.C. 21: 677. E.G.S.

TALL OIL

DUNLAP, LAWRENCE H., and SIEVERT, CARL F. Fractionation of tall oil. U. S. patent 2,565,484. Filed March 15, 1949. Issued Aug. 28, 1951. 7 claims. Assigned to Armstrong Cork Company. [Cl. 260-97.6]

A method for the fractionation of tall oil to obtain a fraction which is substantially free from fatty acids comprises the steps of oxidizing tall oil until it has a viscosity of 15-250 seconds (Gardner-Holdt) at 25°C.; dissolving the oxidized material in furfural; extracting the resulting solution with a petroleum naphtha to remove saturated fatty acids; and recovering an oxidized tall oil fraction which is free of saturated fatty acids. E.G.S.

WILLIAMS, ROBERT C. Lubricant metal-rolling composition. U. S. patent 2,565,938. Filed May 11, 1949. Issued Aug. 28, 1951. 6 claims. Assigned to The Ironsides Company. [Cl. 252-57; changed to 252-49.5]

A lubricant metal-rolling composition (e.g., for use in a cold-rolling mill) of solid consistency has a total free acids content of 6-9% by weight of the composition and consists essentially of a mixture of four parts by weight of tall oil and 96 parts by weight of a tallow which has a free acids content of not more than 5%. E.G.S.

TEXTILE INDUSTRY AND FABRICS—ROTPROOFING

PRITCHARD, GORDON J. Preserving composition. U. S. patent 2,564,276. Filed Aug. 24, 1948. Issued Aug. 14, 1951. 7 claims. [Cl. 167-30; changed to 167-38.6]

A preservative for protein material, timber, and cellulosic material comprises an aqueous solution of the bisphenylmercuric salt of bis(2-naphthalenesulfonic acid)methylmethane; the solution also contains an excess of 2-naphthalenesulfonic acid. E.G.S.

VANILLIN

MIGLARESE, JOHN. Manufacture of syntans from vanillin and leather tanned therewith. U. S. patent 2,564,022. Filed Sept. 8, 1948. Issued Aug. 14, 1951. 2 claims. Assigned to The United States Leather Company. [Cl. 260-49]

A method is described for the preparation of syntans from vanillin. As an example, one mole of vanillin and two moles of phenol are dissolved in each other, and 1.5 moles of 98% sulfuric acid are added over a period of 1.5 hours. The temperature is permitted to rise as the result of the ensuing exothermic reaction. The mixture is stirred for 1.5 hours, 50% by weight of 5% lactic acid is added, and the pH of the mass is adjusted to a value of 3.5 by the addition of sodium hydroxide. The resultant product is ready for use in tanning. E.G.S.

VULCANIZED FIBER

STANGALINI, LUIGI. Processes for the continuous manufacture of fibres. Canadian patent 475,652. Filed Feb. 9, 1949. Issued July 31, 1951. 5 claims. Assigned to Central Adamas S.p.A.

In a process for the manufacture of a vulcanized fiber of high dielectric strength, partially hydrated cellulose is produced by working cellulose in the presence of calcium thiocyanate (4 kg. per 100 kg. of cellulose). 2 figures. E.G.S.

WAXES

CAPELL, ROBERT G. Wax compositions and method for making same. U. S. patent 2,559,398. Filed Dec. 16, 1948. Issued July 3,

1951. 13 claims. Assigned to Gulf Research & Development Company. [Cl. 106-272]

A wax composition which has a high tensile strength is intended for the treatment of wrapping paper, fluid food containers, and the like. As an example, the material comprises a dispersion of 0.1-5% by weight of dimethyldicetylammonium bentonite in a petroleum wax. E.G.S.

YUCCA

FORTMAN, GUSTAVE D. Process for production of fibers. U. S. patent 2,561,617. Filed March 19, 1946. Issued July 24, 1951. 4 claims. Assigned to Flortex Fiber Corporation. [Cl. 19-8]

A process for the liberation of fibers from the yucca plant includes the steps of mashing the leaves progressively to express the fibers from the encasing substances; brushing the exposed fibers intimately to remove the gum and pith; immersing the mass in water at 60°F.; draining the fibers and bleaching them in an aqueous solution of sodium hypochlorite and sodium bicarbonate for four hours; washing the resultant mass in a textile softener soap; and drying the mass prior to the carding operation. The fibers thus extracted are suitable for use in the manufacture of cellulose, linen, paper, rope, and twine. 3 figures. E.G.S.

Book Review

AMERICAN PAPER AND PULP ASSOCIATION. The dictionary of paper, including pulps, boards, paper properties and related papermaking terms. 2d ed. [Clarence J. West, editor] New York, The Association, 1951. 393 p.

The second edition of the "Dictionary of Paper" maintains the high degree of acceptability established by the first edition. The compilers have largely retained the form and content of that good foundation, but where the ever-changing and dynamic nature of the pulp and paper industry has made it necessary, they have carefully deleted the obsolete, modified the present, and added the new. In fact, about 50 definitions no longer appear, many have been improved, and nearly 300 have been added. Chapter One clearly and interestingly defines the scope and boundaries of the undertaking, and says in part, "It was decided that this book should be written so that it could be used by a nontechnical person . . . and . . . it should be acceptable to the expert." It was also noted that: "In writing definitions of paper it is frequently necessary to use papermaking terms. . . . Obviously, if the book is to be of full service, such terms should be defined. Included with these terms are definitions for the different properties and pseudo-properties of paper." The next chapter presents an up-to-date classification and definition of pulps. The changes in this section between editions very clearly reflect the technical advances made in pulping during the past decade. For example, the inclusion of defibrated and exploded mechanical-type pulps and an extension of semi-chemical pulp are noted. The third chapter classifies and defines cotton rags, rag stock for felt manufacture, bagging, waste papers, old rope, and mixed twines. These classifications were supplied by the National Association of Waste Material Dealers, Inc. and therefore are authoritative. The final chapter devotes over 350 pages to definitions of papers, boards, and papermaking terms. What a tremendous task to sift and sort all this information! Indeed the fact that *air dry* is incorrectly defined should certainly be overlooked, for there remain so many definitions, clearly, correctly, and concisely worded, that from the great host of those engaged in making, converting, and selling paper products and those in allied industry can only come thanks for a useful, difficult job, well done. To this, the publisher has added a stout binding and readable print, although no mention of "Second Edition" appears on the outside. Perhaps everyone should know that "blue" is for first, and "red" is for second. It is a pleasure to recommend this second edition of the "Dictionary of Paper" to anyone who has need of the most complete and authoritative source of definitions related to the pulp and paper industry.

D. J. MACLAURIN

AUTHOR INDEX TO BOOKS

American Chemical Society. *Division of Chemical Literature* 1
American Paper and Pulp Association 2
Barnett, H. L. 1
Behar, M. F., ed. 1
Celler, E. 2
Chemical Society, *London* 1
Cornely, B. 2
D'Ambry, R. W. 2
Industrial and Engineering Chemistry, ed. 1
Iowa Academy of Science 1
Langston, S. M., Company 2
Lilly, V. G. 1
Montgomery, G. S., Jr. 1
Symposium on Searching the Chemical Literature 1
U. S. Congress. House. *Committee on the Judiciary. Subcommittee on Study of Monopoly Power* 1
U. S. National Bureau of Standards 2
West, C. J., ed. 2
Zechmeister, L. 1

AUTHOR INDEX TO ABSTRACTS

The letter P preceding a page number indicates a patent abstract.

Addison, J. S. ..... P 63
Addison-Semmes Corporation ..... P 63
Adler, E. 51, 52
Aerovox Corporation ..... P 79
Agronin, T. 47
Ahearn, J. F. ..... P 79
Akerlund & Rausing 33
Aktiebolaget Kaukas Fabrik ..... P 87
Alander, P. 9
Alton Box Board Company .... P 65, P 69
Amberg, W. E. ..... P 70, P 78
American Can Company ..... P 86
American Cyanamid Company ..... P 85
The American Tobacco Company .... P 74
Anchor Hocking Glass Corporation .. P 74
Anderson, G. R. ..... P 83, P 84
Anderson, H. R. ..... P 62
Andersson, O. 50
Anker-Rasch, O. 58
Appling, J. W. 48
Armstrong Cork Company ..... P 87
Arp Nursery Company 28
Arpin, E. P., Jr. ..... P 75
Arrias, E. 4
Bauer, O. 33
Beale, H. D. 26
Beck, C. D. 21
Beck, H. W., Jr. ..... P 86
Belanger, A. P. D. ..... P 69
Beloit Iron Works ..... P 72, P 73, P 75
Bemis Bro. Bag Company ..... P 79
Bemiss-Jason Company ..... P 68, P 71
Benoit, L. ..... P 70
Berg, E. 58
Berkyto, E. 50
Berninghaus, H. 6
Bernstein, I. M. 34
Berry, B. L. ..... P 78
Bicking, C. A. 49
Bigger, R. P. ..... P 86
The Black-Clawson Company ..... P 70
Blatt, J. L. 10
Bolton, J. W., & Sons, Inc. ..... P 73
Bolton, P. S. 12
Bonar & Bemis Ltd. ..... P 83
Bonini, J. H. ..... P 78
Bossi, A. ..... P 71
Bourgonjon, L. R. ..... P 75
Bowater Paper Corporation 32
Boyer, R. F. 39
Brady, C. V. ..... P 79
Brand, K. 50
Brandl, R. J. ..... P 79
Brecht, W. 16
Bruce, D. S. ..... P 79
Bruening, J. M. 20
Brush Development Company 56
Buckman, S. J. 48
Buisson, A. 54
Burr, N. ..... P 63
Burton, L. V. 15
Butler, M. L. 13
Buttery, K. T. ..... P 67
Buyn, K. E. C. 30
Camp, T. P. ..... P 62
Campbell, W. B. 46
Campredon, J. 30
Canada Foils Limited ..... P 82
Canada Paper Company 16
Canadian General Electric Company, Limited ..... P 78
Canadian International Paper Co. ... P 73
Canadian Pulp and Paper Industry 51, 54
The Canadian Raybestos Company, Ltd. ..... P 85
The Canal National Bank of Portland P 76
Capell, R. G. ..... P 88
Casnati, L. A. ..... P 79
La Cellophane ..... P 76
Central Adamas S.p.A. ..... P 88
Chapman, C. E. ..... P 71
Chase, C. B. ..... P 72
Chemical Engineering 55
Chemical Week 47
Cherigié, P. ..... P 75
Chicago Cardboard Company ..... P 63
Chidsey, F. A., Jr. ..... P 63
Clack, H. L. 18
Clarke, H. E. ..... P 73
Clifford, W. B. ..... P 70
Cluett, Peabody & Co., Inc. ..... P 63
Cochran, C. W. ..... P 66
Coggins, G. F. ..... P 79
Coleman Co. 28
Collin, P. H. ..... P 61
Collins, W. L. ..... P 67
Container Corporation of America ... P 63
The Cortland Line Company, Inc. .. P 86
Cress Laboratories ..... P 82
Croco, C. P. 22
Cross, B. S. ..... P 79, P 83, P 84
Davis, A. E. ..... P 80
Davis, L. ..... P 80
Day, F. T. 33, 34, 40
Dearth, L. R. 36
Deck, P. ..... P 68
de Lange, H. ..... P 75
Delcroix, P. 3, 35
Dereser, R. 49
Déribéré, M. 17
De Sylva, O. J. ..... P 80
Detcher, T. E. 47, 54
Diamond Straw & Machine Corp. .... P 73
Dickerman, J. M. 3
Dobbelman N.V. ..... P 67
Dobbelmann, A. A. ..... P 67
Dominion Engineering Works Limited P 75
Downs, H. W., Jr. 23
Dreyfus, C. ..... P 85
Dunlap, L. H. ..... P 87
Dunn, M. S. 10
Dunning, R. M. ..... P 67
du Pont de Nemours, E. I., & Co., Inc. ..... 18, 28, P 77, P 66
Dwyer, J. P. ..... P 63
Elting, J. P. 13
Emrick, C. L. ..... P 64
Emschermann, H. H. 36
Endress, F. 43
Engelhart. L. F. 40

Engelmann, H. 43
Epps, T. B. ..... P 64
"Estevan" 20, 48
Evans, R. N. ..... P 69
Fachmann 55
Falk, M. C. ..... P 66
Fennell, F. L. ..... P 66
Fergnani, W. P. ..... P 70
Ferralyst Desulphurizing Corp. 54
Fife, I. L. ..... P 72
Finno, J. ..... P 80
Flortex Fiber Corporation ..... P 89
Frost, F. H. ..... P 80, P 81
Fortman, G. D. ..... P 89
Foslie, M. 23
Fra. 48
Fram Corporation ..... P 72
Français, J. 37
Franco, S. A. ..... P 73
Frey-Wyssling, A. 15
Gair, Robert, Company, Inc. ..... P 70
Galloway, R. S. 24
The Gardner Board and Carton Co. ..... P 65, P 68
Gärtner, F. 43
Gaylord Container Corporation ..... P 86
Gellendien, W. 55
General American Transportation Corporation 15
General Coated Products, Inc. ..... P 81
George, H. O. ..... P 83
George, W. C. ..... P 86
Germaix, A. 37
Gessler, A. E. ..... P 63
Getchell, R. E. ..... P 84
Gibbons, C. F. ..... P 86
Giertz, H. W. 7
Gillaspie, A. G. ..... P 87
Gladding, W. L. 23
Glover, G. F. 4
Gooderham, C. E. ..... P 76
Goss, W. C. ..... P 61
Grand, L. 10
Grant, F. A. ..... P 71
Greiner, C. J. ..... P 81
Grouse, R. A. ..... P 81
Grupe, W. F. ..... P 63
Gson, R. 41
Gulf Research & Development Co. ..P 88
Gummed Products Company ..... P 79
Gunnar, B. B. ..... P 81
Gut, H. 6
Guthrie, L. R. 13
Guyer, R. ..... P 64, P 67
Haas, H. 27
Hägglund, E. 52
Hall, L. T. 13
The Haloid Company ..... P 77
Hamburg, H. ..... P 61
Hamilton, G. 21
The Hamilton Laboratories, Inc. ....P 87
Hampson, H. ..... P 81
Happ, E. L. 22
Hedstrom, E. L. ..... P 76
Heldmann, H. J. ..... P 82
Heller, E. S. ..... P 61
Hemphill, J. W. 24
Hercules Powder Company ..... P 83
Heritage, C. C. ..... P 62
Hermans, P. H. 44, 58
The Hinde & Dauch Paper Company P 68
Hoague-Sprague Corporation ..... P 71
Hobbs Mfg. Co. 21
Hohl, G. I. ..... P 73
Holderby, J. M. 60
Hollis, R. F. ..... P 65
Holmgren, R. B. 14
Holt, G. W., Jr. ..... P 64
Hood, S. ..... P 82
Hornbostel, L. ..... P 72, P 73, P 75
Houghton, F. D. 15
Howard, E. J. 52
Hoyle, E. P. ..... P 86
Hrubecky, G. 26
Huber, L. 56
Hughes, L. P. 60
Hughes, V. L. 13
Huguenot, H. ..... P 66
Hunt, A. H., Limited ..... P 81
Hurley, A. B. ..... P 78
Hurvich, L. M. 11
Hutt, J. W. ..... P 82
Ingrassia, A. P. ..... P 69
Inskeep, G. C. ..... P 60
Interchemical Corporation ..... P 63
International Business Machines Corp. P 83
International Cellucotton Products Co. P 81
The Ironsides Company ..... P 88
Jahn, E. C. 39
Jameson, D. 11
Jayme, G. 55
Jentgen, H. 8
Johansson, A. 8
Johns-Manville Corporation ..... P 86
Jones, R. M. 47, 54
Jonsson, J. H. ..... P 61
Josephson, H. R. 30
Joshi, G. D. 42
Jull, N. A. 55
Kahn, L. M. ..... P 64
Kalin, J. B. ..... P 86
Karlson, K. R. ..... P 82
Kast, W. 59
Keasbey and Mattison Company ....P 62
Kellenberger, E. 56
Kilpper, W. 42
King, G. J. S. 31
Kingery, W. D. 10
Kingsbury, R. M. 9
Kline, G. M. 39
Klouman, G. H. 25
Kobe, K. A. 14
König, W. 7
Koole, P. ..... P 75
Kotte, H. 5
Koziol, B. J. ..... P 70
Kreyenbuhl, A. 38
Kruse, J. 36
Kulpinski, L. ..... P 74
Landes, C. G. ..... P 85
Landrock, A. H. 35, 48
Lang, M. E. ..... P 82
Lange, P. W. 52
Langsaeter, A. 58
Lauer, K. 44, 45
Leaver, J. M. 56
Leeds & Northrup Company 25
Lemiszka, T. 13
Lepez, L. 46
Lily-Tulip Cup Corporation ...P 70, P 78
Lindgren, B. O. 19
Llet. 24
Locke, J. G. ..... P 74
Lowe, A. A. ..... P 73
Lurie, A. G. 46
The McCabe Paint & Varnish Co. ... 29
McCullough, H. G. 26
McDonald, H. J. 18
McFarren, E. F. 50
McGinn, E. P. ..... P 66, P 67
McKee, W. F. 53
McLaurin-Jones Co. ..... P 80
Magill, D. G. ..... P 86
Malkin, B. A. ..... P 75
Maloy, R. H. 12
Malmstrom, H. E. ..... P 83
Marathon Corporation ....P 64, P 74, P 78
Marchand, J. 34

Marsh, P. B. 13
Marston, W. T. 55
Martin, A. F. 9
Martin, M. E. ..... P 85
Masonite Corporation ..... P 69
Masshard, J. H. ..... P 72
Maxon, K. E. ..... P 66
Maxwell, C. S. ..... P 85
Mayer, C. G. ..... P 77
Mayer, Oscar, & Co. ..... P 77
Mayfield, P. ..... P 83
The Mead Corporation ..... P 77
Mellenger, E. R. ..... P 62
Meller, R. B. ..... P 68
The Mercury Manufacturing Co. 24
Meredith, R. 59
Meskat, W. 22
Metropolitan-Vickers Electric Co., Ltd. 21
Meyer, K. H. 56
Middleton, W. E. K. 12
Miglarese, J. ..... P 88
Millard, J. W. 12
Miller, L. W. 20
Miller, W. S. 20
Millidge, B. D. ..... P 83
Milprint, Inc. ..... P 64
Minneapolis-Honeywell Regulator Co. Limited 17
Minnesota Mining & Manufacturing Company ..... P 79, P 84
Mitchell, R. L. 6
The Montreal Lithographing Co. Ltd. P 82
Morrell, J. C. ..... P 77
Morris, C. V. 34, 40
Morris, D. M. 27
Morris Paper Mills ..... P 64, P 67
Morse, M. W. ..... P 83
Morton, J. L. ..... P 83
Mott Carton and Paper Company ..... P 65
Mukherjee, R. R. 60
Mulloy, L. B. ..... P 77
Myers, D. M. 39
N.V. Phillips' Gloeilampenfabrieken P 75
Nashua Gummed and Coated Paper Co. P 80
Netherly, G. P. ..... P 83, P 84
New York and Pennsylvania Co., Inc. P 69
Nicholas, J. ..... P 71
Niethammer, A. 26
Nopco Chemical Company ..... P 67
North American Paper Process Co., Inc. ..... P 78
Novak, I. J. ..... P 85
Nulty, W. B. ..... P 76
O'Brien, G. F. ..... P 68
O'Connor, J. J. ..... P 77
Okon, N. ..... P 69
O'Neil, F. W. 17
Orr, H. H. ..... P 87
Ostertag, H. M. ..... P 72
Othmer, D. F. ..... P 62, P 63
Ottinger, A. F. ..... P 79
Otto, M. C. ..... P 76
Packaging Institute. *Drug and Pharmaceutical Committee* 38
Padé, P. 38
Pagendarm, J. F. ..... P 71
Paige, R. E. ..... P 69
Paper Industry 51
Paper Patents Company ..... P 83
Paper Strap, Inc. ..... P 71
Paris, P. 5
Parrett, A. N. ..... P 87
Pepler, W. A. 16
Perino, D. A. ..... P 64
Pero, H. 41
Perry, L. M. ..... P 80
Pesez, G. A. 16
Peterson, C. E. ..... P 82
Piazze, T. E. ..... P 84
Pinkney, P. S. ..... P 77
Post Machinery Company ..... P 70
Preston, J. M. 42
Price, C. S. ..... P 65
Priestley, J. J. 54
Printing, Packaging and Allied Trades Research Association 25
Pritchard, E. J. 4
Pritchard, G. J. ..... P 88
Processing Equipment Corporation ..... P 73
Proctor, B. E. 35, 48
Puckett, R. E. ..... P 65
Pulp & Paper 3, 30, 31, 32
Putnam, C. P. ..... P 70
Quinn, P. ..... P 81
Rapson, W. H. 53
Rauch, H. 45
Ray, P. F. 4
Rayonier Incorporated ..... P 87
Rebut, J. A. L. ..... P 75
Renard, A. 23, 27
Renard, J. 34
Research Products Corporation ..... P 76
Reynolds Metals Company ..... P 65
Ricciardi, L. ..... P 63
Ridenour, N. J. 48
Ridgwell, E. G. O. 29
Riegel Paper Corporation ..... P 82
Riess, K. 22
Ringler, W. A. ..... P 65, P 68
Rist, G. A. ..... P 73
Rist, J. M. ..... P 73
Robinson, E. S. & A., Limited ..... P 71
Rockland, L. B. 10
Rolle, C. J. ..... P 63
Romans, R. T. 14
Runkel, R. O. H. 56
Rutkowski, H. R. 50
S&S Corrugated Paper Machinery Co., Inc. ..... P 74
Safford, M. M. ..... P 77
Saint-Vaulry, R. de 20
Samuelson, O. 43
Sandy Hill Iron & Brass Works ..... P 73
Savage, R. H. ..... P 77
Savard, J. 57
Schilling, R. M. ..... P 76
Schwalbe, H. C. ..... P 77
Schwertassek, K. 46
Scott, M. L. 14
Scott Paper Company ..... P 72
Scull, W. S., Company 34
Seiferth, O. E. ..... P 77
Shapiro, J. ..... P 71
Shaughnessy, W. 16
Shellmar Products Company ..... P 76
Shellmar Products Corp. ..... P 80, P 84
Shepard, E. L. ..... P 76
Sherk, D. L. ..... P 85
Shillcox, W. M. 36
Sievert, C. F. ..... P 87
Sillars, G. S. ..... P 71
Sippel, A. 6, 35
Skiff, J. V. 16
Small, T. W., Jr. 23
Smith, L. E. 24
Smith, W. R. ..... P 62
Snartemo, J. H. 22
Sogecro 10
Somer, V. H. ..... P 87
Sømme, K. 12
Spencer, H. A. 50
Spiller, D. 17
Springer, R. A. 6
Standard Paper Box Corporation 40
Stangalini, L. ..... P 88
Starr, T. J. 3
Stenger, R. C. ..... P 68

Stevenson, L. T. 31
Stilbert, E. K. 18
Stitt, F. 35
Stockman, L. 52
Stoever, H. V. H., Jr. ..... P 74
Stora Kopparbergs Bergslags Aktiebolag ..... P 61
Storrow, J. A. 14
Straka, C. J. ..... P 85
Stuck, H. D. ..... P 73
Summer, W. 11
Sutherland Paper Company ....P 67, P 68
Syntics Limited ..... P 62
Teves, D. 27
Textor, C. K. 23
Thibadeau, A. T. 11
Thompson, O. T. ..... P 81
Thompson, R. H. ..... P 77
Thoria, L. 3
Tipka, V. L. 28
The Titaghur Paper Mills Co., Ltd. 32
Todd, J. R. 8
Tomimatsu, Y. 35
Trelfa, R. T. 49
Tribeni Tissues, Ltd. 32
Tuttle, F. J. ..... P 63
Union des Importateurs de Pâtes à Papiers 31
United Drill and Tool Corporation ...P 65
United States Gypsum Company ....P 62
The United States Leather Company P 88
United States Rubber Co. 39
Urbin, M. C. 18
Vahle, R. ..... P 70
Van den Akker, J. A. 36
Vialle, J. 57
Vincent, R. 31
Voorn, H. 17
Vreudenberg, A. J. 22
Wachter, J. J. ..... P 85
Waldorf Paper Products Co. ..P 64, P 67
Walker, R. S. 20
Walkup, L. E. 49
Walton, R. R. ..... P 70
Warren, B. D. 23
Warren, B. D. 24
Wass, W. H. 40
Waters, H. F. ..... P 74
Wayman, M. 53
Weise, F. H. ..... P 73
Welschenbach, C. D. ..... P 68
Werly, B. M. 27
West, C. J. 35
Weston Electrical Instrument Corporation. *Tagliabue Instruments Division* 25
White, W. R., Jr. ..... P 63
Whitehurst, G. 25
Whitwell, J. C. 13
Wibstad, K. 58
Wiley, A. J. 60
Wilke, K.-D. 56
Williams, R. C. ..... P 88
Williamson, M. B. 18
Wilson, L. H. ..... P 85
Winesett, F. P. ..... P 84
Winkler, E. L. ..... P 65
Wixon, P. E. ..... P 71
Wollny, B. A. 26
Wood Conversion Company ..... P 62
Woods, H. J. 60
Worfford, R. B. ..... P 68
Worthen, S. V. ..... P 84
Yonkers, C. H. ..... P 74
Ziska, A. ..... P. 76

BOOK REVIEW

American Paper and Pulp Association 90
West, C. J., ed. 90

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